DOCUMENT RESUME

ED 040 598 08 EM 008 210

AUTHOR	Baruch, Rhoda
TITLE	Computer-Assisted Systems in Guidance and Education: Report of an Invitational Conference on the Implications for the Practice and Education of Counselors. Final Report.
INSTITUTION	Harvard Univ., Cambridge, Mass. Graduate School of Education.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO	BR-9-0428
PUB DATE	Oct 69
GRANT	OEG-0-9-310428-3727(085)
NOTE	70p.
EDRS PRICE	EDRS Price MF-$0.50 HC-$3.60
DESCRIPTORS	*Career Planning, *Computer Assisted Instruction, *Occupational Guidance
IDENTIFIERS	ECES, Educational and Career Exploration System, ILS, Information System for Vocational Decisions, Interactive Learning System, ISVD, PLAN, Program for Learning in Accordance with Needs

ABSTRACT

Four computer assisted systems, demonstrated for a conference on the implications of computer assisted instruction (CAI) for the practice and education of counselors, are described in this report. The systems are introduced in a first part, and include the Information System for Vocational Decisions (ISVD), the Educational and Career Exploration System (ECES), the Program for Learning in Accordance with Needs (PLAN), and the Interactive Learning System (ILS). Each system is then compared with the others using excerpts from the reaction papers of the participants, and further discussion of CAI is presented with topics focusing on the issues, the potential, implications, and recommendations. (SP)

PRINTED BY THE STANDARD REGISTER COMPANY, U. S. A.

FORM 0801

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED040598

FINAL REPORT

Project No. 9-0428

Grant No. OEG-0-9-310428-3727(085)

COMPUTER-ASSISTED SYSTEMS IN GUIDANCE AND EDUCATION:

Report of an Invitational Conference on the Implications for the Practice and Education of Counselors

Rhoda Baruch

Harvard University
Graduate School of Education
Cambridge, Massachusetts 02138

October 1969

U.S. DEPARTMENT OF

HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

EM008210

ED040598

Final Report

Project No. 9-0428

Grant No. OEG-0-9-310428-3727(085)

Computer-Assisted Systems in Guidance and Education:

Report of an Invitational Conference on the Implications for the Practice and Education of Counselors

Rhoda Baruch

Harvard University
Graduate School of Education
Cambridge, Massachusetts 02138

October 1969

Acknowledgments

A conference, similar in form and content to the one reported here, was proposed originally in 1968 by Roger Myers and Donald Super of Columbia University's Teachers College and we acknowledge use of that proposed conference as our point of departure. Miss Judith Weinstein, of the U.S. Office of Education, made an important contribution in the planning stage in suggesting that representatives of ES '70 schools take part in the conference, and the proceedings were enlivened by their presence.

Participants in the conference were asked to write reaction papers at the conclusion of the conference. This report is based heavily on those reaction papers, and the list of authors of those papers is given in Appendix A.

Cooperation from the staff of the ISVD project, particularly David Archibald, Allan B. Ellis, and Robert Aylmer, and similar cooperation from the IBM staff in Cambridge made demonstrations and interaction with computer systems possible. These experiences with the experimental systems provided an essential component for this conference.

David Tiedeman, who served as co-director with me, is intimately associated with the original conception and development of one of the computer-assisted systems demonstrated at the conference. Since many of the reaction papers compared and evaluated the displayed systems, and since I have played no part in the development of any of the systems except as an interested observer, I have assumed the responsibility of writing this report. I wish to acknowledge, however, the principal role played by Dr. Tiedeman in bringing this conference into being and imbuing it with its special character.

CONTENTS

Introduction

- Educators Meet the Computer Systems
- The Participants
- The Computer-Assisted Systems
  - ISVD
  - ECES
  - PLAN
  - ILS
- Comparison of the Systems

The Issues

- Dehumanizing vs. Liberating
- Cost
- Appropriateness for the Disadvantaged and Other Populations

The Potential: The Great Promise

The Great Task

Implications for the Practice and Education of Counselors

Recommendations

Conclusion

Appendix A: List of Authors of Reaction Papers at Conclusion of Conference

Appendix B: Participants in the Invitational Conference on Computer-Assisted Systems in Guidance and Education

Appendix C: Conference Program

Appendix D: Sample Protocol of Exchange between Student and ISVD

References

INTRODUCTION

EDUCATORS MEET THE COMPUTER SYSTEMS

"Pandora's Box!"
"Expensive!"
"Overwhelming!"
"Mind-blowing!"
"Dehumanizing influence!"
"Humanizing interaction!"
"Great promise!"
"Feasible!"
"Distant beyond possibility!"
"Great task!"
"Potentiality is mind-freeing!"
"Challenging!"
"Here to stay!"
"A giant step!"

When a group of educators were invited to a conference and exposed to several experimental systems employing computers in guidance and education, their reactions ran the full gamut sampled above. The Invitational Conference on Computer-Assisted Systems in Guidance, held in Cambridge, Massachusetts, June 22-27, 1969, was co-sponsored by the Harvard Graduate School of Education and Teachers College, Columbia University and was funded by the U.S. Office of Education. Participants,[1] from among the most prominent counselor educators in the country and from several innovative school systems known as Educational Systems for the Seventies (ES '70), were brought into direct contact and interaction with two different computer-assisted guidance systems:

(1) the Information System for Vocational Decisions (ISVD) a joint effort of the Harvard Graduate School of Education, the New England Education Data Systems, and the Newton (Massachusetts) Public School System, under the direction of David V. Tiedeman and his colleagues

and

(2) the Education and Career Exploration System (ECES), an experimental system developed by the Advanced Systems Development Division of IBM, under the direction of Frank J. Minor and with consultation from Donald E. Super and his colleagues at Teachers College, Columbia University.

In addition to these two direct interaction experiences, the conference program[2] introduced by film and lecture yet another system, Project PLAN (Program for Learning in Accordance with Need), a comprehensive

---

1. See Appendix B for list of participants.
2. See Appendix C for program.

instructional and guidance program employing computer management for teacher-support activities, and developed by John C. Flanagan and others at the American Institutes for Research, Palo Alto.

A system (currently on the market), the Interactive Learning System (ILS), representing an early commercial spin-off from the ISVD under the direction of Eugene Wilson, was informally demonstrated and afforded some participants still another experience, "on-line" with the computer for further reference and comparison.

It is hardly remarkable that diverse responses to these initial contacts with computers should be forthcoming from participants representing school communities as distant, geographically, as Portland, Oregon and Willingboro, New Jersey; and as distant, economically, as the Mantua school in Philadephia and Nova schools in Florida. Further, conference attendees represented the divergent perspectives of counselors, teachers and administrators dedicated to innovation in the ES '70 school systems under difficult "field" conditions; and more sheltered researchers, theory-minded academicians and counselor educators from the universities. Conferees approached the computer systems with different levels of prior familiarity and awareness. Also, different temperaments and different sources of anxiety were represented at the conference.

However, only partially were these varied reactions reflections of the diversity of the participants. Few, if any, guests at the conference did not themselves as individuals experience the full gamut of reactions, alternating from euphoria to depression. Not uncommon is this alternation between states of euphoria and depression, a theme elaborated by one speaker, Joseph Weizenbaum, an information scientist from M.I.T.'s Project MAC and echoed in many reaction papers. Anthony G. Oettinger, in Run, Computer, Run, more generally notes that the introduction of technology into education is an "age-old process alternately exhilarating and depressing." The "great promise" brings with it "the great task." As one participant (Earle J. Moore) wrote, "When I engaged in imagery and fantasy for future projection of computerized individual systems, I was stimulated to seek widely and apply the systems to a variety of educational problems. However, when I was confronted with the gaps in our knowledge of human behavior, teaching and learning processes, and the overwhelming program construction details, I was prone to become merely an interested observer. Weizenbaum's comments relevant to this point regarding the procedural unknowns had great impact on my thinking." A participant, Joseph Hollis, writes at the termination of the conference, "We used to be limited by our 'abilities' but now we seem to be limited by our dreams." Unfortunately, other limits do exist which Dr. Hollis would probably soon confront in the next phase of the cycle.

Threat of encroachment by the imposter, the computer, concern that we not become so "dehumanized in our society that we accept the fact that students can be counseled by computers," a sense of being overwhelmed by a gigantic monster were among the feelings expressed and worked through. Visions of the future, "image breakthroughs," feelings of participating at the threshold of a new era in a creative enterprise were even more common and lent a sense of excitement to the entire conference.

Several sobering considerations chastened the heightened excitement. Among these considerations was the realization that given a tool or servant that would do exactly as we specified, paradoxically, would confront us with the most severe task-master guidance and education had yet encountered.

Another sobering reality dampened spirits generally. The ES '70 and the ISVD, initiated about the same time in 1966 and never formally associated before this conference, had been funded within fifteen days of each other. The IBM-supported ECES had been initiated at about the same period. All of these projects were at the end of their period of support. Where could one proceed with new insights, enthusiasm chastened by harsh reality, and no economic resources? Everyone left the conference with this question in mind, even as they had recommendations to make and a commitment to proceed to face the new possibilities.

THE PARTICIPANTS

The participants[3] were an excellent cross-section of professional personnel in American education. To reflect change and potential change, eight ES '70 schools were represented by counselors, directors, coordinators, and administrators from various parts of the U.S.

To represent research and frontier people, American Institutes for Research (AIR), Teachers College at N.Y., and Harvard staff were represented. For business and industrial representation, Westinghouse, I.B.M. and ILS (Interactive Learning Systems) personnel took an active role.

To represent counselor-educators ten different faculty members were involved. The State Department of Public Instruction from several states were represented.

In other words, the selection of participants made possible a very active meeting with a sharing of information, feelings, concepts, and dreams. The interaction was free and the structure of the conference encouraged action, reaction, and interaction.

---

3. Professor Joseph Hollis of Ball State University provided this description of the participants.

Three different computer systems were operative during the conference and hands-on time was scheduled so that participants could interact with each.

THE COMPUTER-ASSISTED SYSTEMS

A new frontier for counseling and guidance was opened with the advent of computer technology. Several teams of pioneers, organized into separate enterprises, have, since about 1966, sought to meet the challenge of new possibilities. The systems, in their current stage of development, are described only briefly here, but are elaborated in greater detail elsewhere (ERIC Capsule No. 3, Vol. 1, June 1968; Annual Reports of ISVD, 1966 to 1969; Bohn and Super, 1969; Minor, Myers and Super, 1969; Jones and Nelson, 1969; Jones, 1969; Flanagan, 1968).

The Information System for Vocational Decisions (ISVD)

The ISVD is dedicated to the goal of developing responsibility for decisions and seeks to achieve this goal by teaching the process of wise decision-making through the use of a computer-based training system. The program is designed so that the user can relate knowledge about himself to data about education, training, and work as a basis for his career decision. The system links person, computer, and teacher or counselor in such a way that the student can conduct a dialogue, in natural language, with the computer, while the counselor assists in interpreting and evaluating the results of the dialogue.

The ISVD places the student among a variety of resources, including the computer's files, enhances his access to them, teaches him the stages in decision-making, even gives him insights into his own pattern of arriving at decisions, and enables him to engage the resources in a controlled setting so that he can develop the skills of processing data and making decisions.

The computer stored several million data potentially relevant to career choice in thirteen different files; the major three containing educational, vocational, and military data. The files are arranged in such a way as to allow the user to move at will from a general review to a specific focus, as he weighs various alternatives. In the interaction with the computer, the user is asked about the alternatives he might be considering, what parts of a decision he might feel are significant, and what his bases are for any preference he might show for a given specific option. An example of one such dialogue with the computer, which does not show the many possible branches in the program, is given in Appendix D. As a user delves further into the data in the files and into his reactions to the data, he is able to clarify his ideas until he makes a choice, which may be one of the several alternatives under consideration or may be further exploration.

Throughout, a deliberate distinction is made between data (facts) and information (facts interpreted in relation to use) and one task of the system is to enable the individual to transform data into information. The user is taught to interpret data according to his own knowledge, experience and purposes, so that his organization and use of the data represents his own personal relationship to them in the process of decision-making. Through a system of monitoring, consisting of the computer's recording the successive interactions of the student as he progresses through the various stages of decision-making, and of reminding him of these prior interactions, the user learns not only to decide, but how he goes about deciding, i.e., his pattern of action. The result sought is a higher order of understanding of both the decision-making act and the panorama of career choice in which decisions are linked. The computer requests summary statements at the time each decision is made and such summaries are stored as part of a personal data file, accumulated for each user. This file contains as well the individual's past and current educational and psychological characteristics. In this small personal file is a record of the user's career concept as it has evolved from his review, exploration, and clarification processes.

The ISVD is also programmed to play the Life Career Game with the user simulating experiences which are part of a projected future chosen by the player. The player goes through a life plan for any number of fictitious people and is taught to recognize discrepancies between personal characteristics and realistic alternatives.

Two devices employed by the ISVD are noteworthy: the ISVD command language, a simple language permitting the user to take over control of the system flow and to move about in the system as he determines; and the scripts, like manuscripts of a play incorporating sets of rules which define the way in which the computer is to respond.

John Vriend, a participant at the conference, described the ISVD and the interaction with this system as follows:

> "The full-blown complexity of the ISVD became evident to the conferees as its historical development was unfurled for them. The creation of endless scripts accounting for as many eventualities as might come up during a user's time at the terminal, for example, became a mountainous undertaking still incomplete at the time of the Conference. (In demonstration trials, where Conference participants simulated a run-through by a student initially interacting with the system, the televised language appearing on the monitor screen would occasionally 'crash' and the inquirer would be returned to 'go' because a question had been asked of the computer for which it was not programmed.) Many of these scripts operationalized components of the ISVD 'paradigm of vocational decision-making' (Tiedeman, 1961; Tiedeman and O'Hara, 1963) and were intended to enable a user to become more aware of his own choice-making processes, to help him to see himself as the intervening agent in his own thought structures.

> Requiring the use of natural English (as contrasted to mathematical or symbolic language), imposing so few format boundaries upon a user as to appear virtually loose and open-ended, and relying on a well-conceived theoretical framework of vocational decision-making, the design of the ISVD was indeed grand! That its manifestation appeared more visionary than currently practical, or so it was seen by many of the conferees, should have been a surprise to no one."

The Educational and Career Exploration System (ECES)

Like the ISVD, the ECES uses a computer on a time-shared basis, allowing several users at various locations to share the computer simultaneously, and thereby effecting certain economies. The system is designed for users in specified vocational life stages (Super, 1957), the latter phases of the growth stage and throughout the entire exploratory stage. These exploratory efforts are especially important for ages from 12 to 19 years, and the school provides an ideal setting for such exploratory behavior.

The computer-system is intended to remedy certain perceived deficiencies in usual procedures. The sheer difficulty of managing the enormous amount of information about the world of work, the educational paths leading to this work, and all the personal facts relevant to the vocational facts frequently result in the neglect of educational and vocational orientation. Counselors also find that at this stage of students' lives, conversation with them, supplemented by reading material, does not foster the exploratory efforts adequately.

In the initial transaction between user and computer in the ECES, the computer queries the user who responds to the multiple choice format by pressing an appropriate key. There is no typing required, and concomitantly limited flexibility in responses. It is in this format that the personal data of the student are entered into the computer file. ECES then provides the user a file-management capability with access to three main files which the student may manipulate in several different modes, e.g., "browsing" or "clarifying". The three files contain facts about vocations, curricula, and institutions of higher educution. Because the files are similarly organized, we will describe only the use of the vocational file.

The role of the computer is largely to serve as a multiple cross-index to this file. By specifying certain descriptors in the early or exploration stage, the student may retrieve the occupation names and definitions that satisfy the combination or union of these descriptors. The descriptors usually deal with activities and work conditions that appeal to the student. When the user has a number of occupations that he is willing to consider, the machine matches the list of personal and educational desiderata filed under each such occupation under consideration with the personal and educational data on file for the student. The names of other

occupations not mentioned by the student but compatible with his school data and self-concept interest profiles are also provided by the computer. The computer report includes statements on the match between student characteristics and those required for the tentatively considered occupations.

Subsequent to this exploratory phase and matching of characteristics, the student may examine the occupation entry in the file more deeply and may select a preprogrammed work sample game from the file. The computer then administers the work sample game, familiarizing the student with the nature of the work.

Reports of several kinds are generated by the computer: (1) a summary of the student's responses throughout the analysis of an occupation; (2) a comparison between the student's school and self-estimate data and the level of education and field of activities associated with the occupation; (3) the frequency with which specific high school courses were recommended for the occupations under consideration. The student may take these reports with him for review with the counselor or family.

Both the counselor and the student can exercise only very limited control over the computer interactions since many parameters are set by the system designers and are not subject to modification by the user. Such parameters as "goodness of match", number of descriptors, criteria for compatability between personal and occupational characteristics, and the work sample games are all predetermined.

The work sample game is a unique feature of the ECES and sparked the interest of conferees. In this job simulation experience, the computer presents the student with situations and problems he would likely encounter in this work, asks him to solve these problems, and compares his performance to best recommended practices.

The ECES was still being field-tested in a high school in Montclair, New Jersey at the time of the conference. Results of the testing would be assessed by an independent staff at Columbia's Teachers College.

The demonstrations of this system were very smooth, with no crashing or other signs of system unreliability. Frequent repetition by the computer of the advice to "see your counselor" about discrepancies between personal characteristic and job requirements disturbed some counselor-observers who were afraid, not of encroachment by the computer, but of overwork caused by this judicious referral.

The Program for Learning in Accordance with Needs (PLAN)

PLAN was described and discussed by Brian Jones who showed a film, but had no computer or system components at the conference for demonstration. PLAN uses a computer quite differently than ISVD or ECES.

In PLAN the computer is a management aid to the teacher. It is used to perform several types of statistical analyses, including a comparison of students' proposed decisions with the longitudinal data gathered from Project Talent. The computer is also used to analyze student performance as a function of teaching method and medium, to keep a detailed record of the student's progress, and to help select learning "modules" at the appropriate level of difficulty for the student's level of achievement.

With the aid of such analyses, learning efficiency toward goals set by the student should be increased and goals and abilities should be more nearly brought into a realistic match. Assessment of goal reality and programs to reach these goals are based on the data from the five-year longitudinal data of Project Talent. Programs of learning better suited to the individual can be developed.

Although goals are conceived as rather static and the guidance function as extremely simple, PLAN succeeds in integrating instruction and guidance in the one system. PLAN helps the <u>teacher</u> in his decision-making activities.

The Interactive Learning System (ILS)

Demonstrated only informally at the conference, the ILS had the advantage of requiring little portable hardware and could lend itself to such informal demonstration, using any telephone to connect to its central computer. ILS has stored several files and automates the retrieval of information from the files, such as for example listing local Schools of Undertaking if that is the occupation in which interest is expressed.

COMPARISON OF THE SYSTEMS

In assimilating the experience of interaction with the systems, participants inevitably compared and contrasted the systems. Vriend noted that ECES, while having common features with ISVD, was a lesser, more circumscribed effort. He continued:

> "Where there was much about the ISVD which was open-ended, tentative, unreconciled, non-operational, there was very little which could be so characterized about the ECES. The latter was a neatly organized and attractively packaged educational-vocational information library which, by all evaluative criteria, should appeal to students who are ready to make use of the material it contains. Certainly its installation in a school would enable a counselor there to help his counselees to discuss and plan their educational-vocational futures more effectively. The ISVD, on the other

hand, opened doors to future uses of computerized systems in counseling which a study of the ECES would not reveal. It was this future-oriented focus which dominated the Conference."

Hollis found the process of contrasting the systems helped him to identify the potential functions, values, and limitations. His summary follows:

"ECES	ISVD
Closed end	Open end
Linear	Multidirectional
Tunnel	Flexibility
Data retrieval and comparison	Data introduction with opportunity for student to interact
Today (built for today with potential for immediate use)	Tomorrow (built to be ready for tomorrow and to take advantage of change as it occurs)
Improvement on what now exists	To push frontiers so as to find and improve ways of interacting
Source of information	Computer as media
Trait, factor, numerical approach	Language (Communication) between Student and Computer (Decision-Making)
Selection among limited choices	More comprehensive freedom to choose
Reactive (Student reacts to material presented.)	Active-Interactive (Student takes an active role in the system and interacts with it.)
Marketable (built with potential for selling)	Research (Designed for research and to expand the horizons)
Cognitive domain primarily	Uses the Cognitive but strives for Affective Domain
Whenever student comes to problem or affective area he is referred to counselor.	Strives to have system (machine) interact with student so that student learns to solve problems or in affective area to organize, structure, understand, and, if needed, modify

ECES	ISVD
System stores information and has a sequence of steps which if student selects them the hope is that this will enable him to grow.	System is that by which student interacts and the belief is present that student has capability to grow if given opportunities to control."

Myrtle Roy, a counselor-educator from the Mantua School in Philadelphia, remarks that her spontaneous reactions may not be valid for students entering the systems, but notes the environment differed greatly with each system. Her perceptions follow:

"The Interactive Learning System is programmed to give the student data about the following:

1. Colleges
2. Technical and vocational schools where training for specific occupations is available
3. Characteristics of occupations

ILS is three separate systems which answer questions in each of the above areas. It does not seem to have the ability to help a student develop his understanding of, and skill in, making decisions.

When the student enters the system it seems to me that it is assumed that he has already defined the problem, and gathered most of the relevant information. The role of ILS is simply to make proposals. The system seems to have eliminated the opportunity for the student to first change the data into information which has meaning for him and then synthesize the information, while at the terminal. For me, therefore, the environment at this terminal was sterile. There was no opportunity to experiment or participate creatively in the act of discovering the self."

Comparing with the ECES, Roy continues that ECES is structured to be helpful to students representing a wide range of socio-economic backgrounds in making wise decisions, under the guidance of a counselor. She continues:

"But this system also purports to give the student the opportunity to become involved in the decision-making process while in the system. The student is encouraged to define the problem. He enters into a self-appraisal exercise. He receives data about himself based on school records. The system is programmed to determine whether or not these two appraisals are compatible. If there seems to be a disagreement the student receives a '?' and is referred to his counselor.

By programming in this suggestion at this time it seemed to me that the client was passively rejected by the system. If ECES contains a set of decision logic rules to aid the student in sequencing activities, if it is programmed to adapt to and be under the control of the student, then the student should be given the opportunity to express his feelings and look for possible ways of action while still in the system. Instead the system withholds help. Suddenly the environment becomes formal and unfriendly."

Of the third system, ISVD, Roy says,

"It was an exciting and challenging experience. There was no sensation of powerlessness. There was no feeling that I was being judged by an impersonal machine as was the case with ECES. Instead I felt that I had entered into a system which had the potential to help me explore my own feelings, hopes, and dreams; then check them out with reality in a private and accepting environment. ISVD gives clear cut and free choices. It did not seem to confront the student with data at a time when it might inhibit the expression of feelings and dreams.

ISVD did not function very well during the demonstration. Somehow that did not lessen the excitement which I felt, or prevent me from imagining the kind of experience which one might have in such a system, once the mechanical bugs are eliminated. The interaction with this open-ended system has the potential of helping students develop understanding and skill in the procedure required to make wise decisions. The psychological environment connected with ISVD is the antithesis of the environment connected with Pandora's Box. It is filled with a sense of agency rather than a sense of dependency."

Another counselor from an ES '70 school in Quincy, Massachusetts, with experience with Project PLAN, Dana Smith, finds ISVD and ECES not so different and comments:

"Basically I see both the ISVD and ECES systems performing the same operation -- that of disseminating information on occupational and educational opportunities available to the student.

The ECES system seems to create a feeling of exploration -- it uses the multiple choice approach and pictorially seems to be more sophisticated.

The ISVD system allows the student to relate to it and helps the student to actively process relevant data. It gives the students moments of insight and helps them in the process of decision-making. Upon these conclusions I feel that the ISVD system is not only an information giving device but an educational learning tool as well."

Dana Smith makes an interesting observation about Project PLAN:

> "In reference to Individualized Instruction -- Project PLAN has been in my school for the past two years. I see it as a means for the counselor to come in closer contact with the students and teachers involved. The classes are informally structured enabling the counselor to enter the classroom, see the student in a working situation and interact with them. The teachers in all PLAN classes have the same period free each day to allow them to confer -- this gives the counselor an excellent opportunity to have a closer relationship with them in discussing their students."

Margaret Oberteuffer, another counselor from an ES '70 school, finds merit in the several systems:

> ". . . the ILS: a useful item to have on the market. It is honest, if limited. It probably will be of inestimable help in preparing the public and educational practitioners for computers.
>
> . . . the ECES: a long step toward guidance from ILS, in a rather highly developed state and therefore easily completed for marketing if IBM would be convinced. Again, it is honest and useful now for kids, parents and counselors and also absolutely essential to computer-world laymen in order to:
>
> a) build machine literacy in potential users of future systems;
>
> b) generate a need among them for more comprehensive systems; and
>
> c) prepare the skeptical, fearful, and unaware to accept into our culture the ISVD-type later.
>
> . . . the ISVD: a beautiful idea, probably completely workable with more time and after people are prepared. If the prototype development, trials, and eventual launching bring along enough people for familiarity and involvement and if sufficient feedback from the field tests is incorporated to bring the wording, etc., within the reach of the users-to-be, I see a real breakthrough in practice. For without doubt, the ISVD's pioneer concept and theoretical model stand to revolutionize both effectiveness and subsequent developments."

Lee Ross, a counselor from Willingboro, New Jersey, who objected during the conference to the introduction of computers into guidance, later wrote,

"After a great deal of soul-searching and analysis, I feel that I can accept the concept of the computer as a tool for counseling. I envision it as playing a pertinent part in the dissemination of information to the counselee, as well as an aid in helping him to better understand himself and establish realistic goals. This is particularly true of the ISVD system, as opposed to the other systems. Unfortunately, when I viewed the field test the machinery was not working well, and the demonstration left a great deal of confusion in my mind. However, as I read the position papers and discussed the ISVD computer with other participants, its goal became clearer in my mind."

Paul Smith, another participant and superintendent of schools in another ES '70 system found the systems very similar, but notes a limitation of ISVD:

"I must confess that the stated difference between the ECES and ISVD systems escapes me. Although I pushed the question several times, I never did get what to me was an understandable answer. It seemed to me that both demonstrations in effect were striving for about the same goal.

It was obvious to me that ECES was technically far beyond the ISVD. Whether this is a discrepancy which can be worked out in further technological refinements, or whether it is due to differences in fundamental nature of the two systems, I am not competent to judge.

A very severe limitation of the ISVD, to me personally, was the type of writing on the cathode ray tube. I found the addition of lines distracting, and also there was a continuous, almost imperceptible, movement which I found most annoying. The ECES, of course, used a frame which presented none of the difficulties of the other method. It also seemed to me from a standpoint of ease of use, the ECES was 'cleaner' and simpler. The use of one screen, rather than two was in itself a great advantage."

Another administrator, Richard Pearson of Duluth, Minnesota, unlike Paul Smith, noted a significant difference in the systems:

"Of the computerized guidance systems viewed and discussed at the Conference, only the ISVD system truly stimulates the imagination. ECES, as well as the ILS system, are highly structured with limited response capability. This tends to produce a straightforward approach more indicative of instruction than of counseling. Most counselors, however, merely see it as a dehumanizing influence on the program."

The third administrator at the conference, Warren Smith, seems to concur with Pearson in the appraisal of the relative merits of the systems:

> "Each system demonstrated has merit. One is obviously more advanced technically while the other (ISVD) has reached closer to the heart. If I were required to judge at this point, I would favor ISVD. Machines do not have hearts or souls so man must make very effort to program them in such a manner that this essential factor is treated as sympathetically as possible. More time is required; time to dream; to synthesize; to evaluate and then to build and demonstrate.
>
> If immediacy was the important factor, the Wilson (ILS) product is now marketable. I believe it to be premature and therefore not sufficiently sophisticated. It will appeal to those educators who are trying to be fashionably modern. A great danger lies in their paths. Unfortunately, the danger is for the child, not the educator."

Aster Lee Mock, dean of an ES '70 school in Houston, Texas, recommends the introduction of a computer-assisted system into her school, as will be noted in the section of recommendations. In her discussion she compares the ISVD and ECES, reserving judgment on the ISVD because its effectiveness will depend upon "the quality of the script and the expertise of the scriptwriter or programmer." Cost will be another consideration. She maintains the system is good and could be used advantageously in the counseling program. The ECES, not as complex or complicated as the ISVD, could perhaps be introduced as a beginning computer, but here, too, the quality of the guidance materials in the computer, was brought into question.

THE ISSUES

The overall consensus of participants was that computers will contribute to the guidance function and will have implications for the education and role of the counselor. A number of issues, then, become important considerations: cost; reliability; marketing; general applicability, especially for culturally deprived populations; change and its attendant threat; the humanizing effect vs. depersonalization of the computer; closely related, the issue of power and control exercised by user and counselor in interaction with the machine; and lastly the issue of privacy and trust.

Reliability and, beyond reliability, even resistence to destructive manipulation is a requirement for any technical devices to be used in the

school. The ECES seemed to perform in a reliable manner during demonstrations and field tests still under way can better establish this performance. The ISVD "crashed" during demonstrations and seems far from the operational reliability for non-experimental technology in the school. However, as one participant wrote, "Of course the system has not been fully perfected, but the outlook is favorable," expressing sentiments widely held. In spite of the evident difficulties, there was pervasive optimism among the participants that this problem of reliability could be resolved in the future.

If reliability, then, is optimistically dismissed as an issue, cost cannot be so readily dismissed, although the two issues are intimately related in that it will take a considerably large expenditure of money to make a system such as ISVD operationally efficient and reliable. Vriend, noting that the ISVD is more sophisticated than any system now in existence, but is still a primitive effort, perceives the problem as follows:

> "Present-day hardware is fantastically efficient, fantastically capable. The problem is the age-old one of money. The man-hours of creative thinking and effort by devoted experts from engineering and other specialty areas needed to develop the kinds of systems authentic prophets see as possible realities are costly beyond anyone's current ability to pay. Private enterprise would develop such systems only if projected market returns warranted the outlay (Conference participants were given the impression that it would not be profitable for IBM to market the ECES.), and the principal customers of such systems would be public school districts.

In view of the manifold problems faced by school systems, many of which arise from declivitous tax bases and an inability to finance the status quo, without even trying to upgrade current levels of educational excellence, one hardly can predict an abundant livelihood for computerized counseling in the next score of years. Indeed, there was discussion among some of the Conference participants centering on whether such endeavors, like those which put astronauts on the moon, ought not to have been postponed in favor of meeting the presently desperate educational, social, and personal needs of disadvantaged school children whose numbers are legion in our land.

Sober analysis of the data presented at the Conference would lead one to make the safe prediction that computer-use will increase wherever educational costs can be thus reduced. Full employment of the computer for routine cost-reducing tasks will undoubtedly become much more universal before computers programmed to interact with counselees in natural language as surrogate counselors will even be considered. While school counselors are expensive, machines have not yet made them expendable."

As computer technology becomes more used and diffused throughout our society generally and our education system in particular, the entire issue of cost will be very different. Telephones today are hardly considered an expensive luxury in our schools, but consider what an outrageous extravagance they might have been at the turn of this century. Ultimately, perhaps in one decade or two, the expense will be reduced and the use more economical. In the mean time, at least one counselor expressed concern that "incomplete developments such as ILS and ECES" not be put on the market prematurely in order to seek profits. Coia remarked, "They (the systems) have so much potential that at this point are being forced into the background because of the need for marketing."

Several counselors and educators from ES '70 systems, noting the high cost of development, might still justify the expenditure in terms of the needs of their particular student populations. Whereas some communities such as Willingboro are so desperately in need of more rudimentary resources such as textbooks or basic equipment, and Janet Jackson of Houston expresses some negative reservations about "the high cost of programming for a conversational mode, which I feel is very functional and practical for my school's student population," Myrtle Roy of Philadelphia argues for the adaptation of such systems for the "so-called culturally-deprived areas." She maintains that the systems have been designed for and field tested in schools populated by students from middle and upper middle class families. She questions the usefulness of the scripts to young people who do not read very well and have difficulty verbalizing their thoughts and feelings. Roy, writing of the "culturally deprived," the "socially disadvantaged," or the so-called unmotivated, poses the question: "Can this group of young people profit from computer-assisted systems?" She has had extensive experience as a counselor sharing feelings of and concerns of such students and claims some understanding of their life style. She argues:

> "As a result of this experience I reject completely the assumption that these youngsters are not motivated. If these young people were not moved by that force, that desire, that emotion and enthusiasm which is motivation, many of them would never come to school. The question then becomes why do so many of these pupils fail to achieve the understanding and basic skills which would make it possible for them to enter into the mainstream of our country's economic and social life? What is the difference between the average pupil who comes to school from Mantua, in West Philadephia; and the average pupil who comes to school from Oxford Circle, in Northeast Philadelphia?
>
> Some of the characteristics of the child from Mantua which are unique are as follows. Many of these pupils have a poor self-image. They see themselves as inadequate. They have had few successful experiences in school. The are often made to feel unacceptable in school and not wanted at home. The 'gang' may be the only social institution in which these young people can become truly involved and achieve status.

In the school setting these boys and girls are apt to appear apathetic and fearful. They frequently are unable to express their emotions in an acceptable manner. When attempts to express feelings are made, or when outbursts of emotion come, they are often inappropriate, or generalized out of proportion to the stimuli.

The pupils about whom I speak are often unable to trust adults and feel threatened by them. They may be defensive, rebellious, and resort to oppositional types of behavior. Like every other child this student brings to school the culture of his home, the mores of his peers and his community, and the prejudices related to his ethnic, racial, and class background. All this he brings to the middle-class oriented school which expects him to be able to think in abstract terms, analyze his daily experiences in a rational manner, and above all, project himself in the future as an adult functioning satisfactorily in middle-class America.

The dynamic force which we call motivation, I believe, is the birthright of everyone. The challenge then, is the discovery of techniques and procedures which will effect within these young people the willingness to risk using this birthright to develop a rewarding and satisfying career. I submit that a computer-assisted education and guidance system which has the characteristics of a creative enterprise, as described by Jerome Bruner can succeed in involving such pupils."

Roy elaborates on Jerome Bruner's notion of "creative enterprise" (as presented in On Knowing -- Essays for the Left Hand), an art which produces "effective" surprises. She specifies what is meant by "effectiveness" and "combinational behavior," involving "an emotional sensibility and a kind of intuitive familiarity that gives me the sense of what combinations are likely to have predictive effectiveness and which are absurd." "ISVD impresses me as having the characteristics of a creative enterprise, " Roy continues.

A special potential usefulness, then, of an ISVD adapted for a disadvantaged population in need of additional and appropriate supports from the school system could possibly justify the extended expenditure of further development.

The introduction of change into a system brings with it attendant fears and possibilities. The proposed technology change is introduced at a time of crisis in education and further extends the boundaries of the crisis. Carter Caudle writes of the counselor's fear of losing his position in the school. Erickson articulates still other aspects of the issue:

"I feel the big threat felt by counselors as computers are introduced in the field is fear that a monster will be created which will end up as the master. While we know relatively little about the need and effect of the human relationship in counseling (even conceding that a human-machine relationship may also have value for some) most counselors feel its importance has been underestimated and not truly measured. It seems to me from the discussions that this may be precisely what consideration of such systems may force us to examine, measure, and evaluate.

Related to this is the threat to some, I am certain, that use of computers will push the counselor into the role of a technician for the system, sort of servant to the machine. For this reason, I feel some of the responses built into the ECES system ('see your counselor') provide more acceptable start for counselors in the field. It recognizes the counselor as a still-functioning part of the system."

Joyce Chick, cognizant of the current sense of helplessness that can be induced by machines that perform man's functions more effectively, more rapidly, more accurately, suggests that the ego is forced to mediate the battle of man vs. machine. She writes:

"In the counseling profession particularly, the professional orientation is one of humanistic values. Professional counseling personnel who are not knowledgeable of the intended goals of computer-assisted systems may view the new technology as a very real threat to the foundations of the profession. They do not see the computer as a supplementary tool but rather as a replacement of the professionally trained counselor. For the counselor who passes his day in 'busy work' rather than in rendering professional counseling services, the computer and its potential possibilities render a real threat. Such a mechanical device could force counselors to counsel! Moreover, the counselor may well think, 'How can any machine perform the services I am performing?'"

David Cook, reflecting in a similar vein on the impact of the computer, as empowering as opposed to dehumanizing and overwhelming, expresses these ideas:

"We are static in our capacity to build models of what we do when we counsel. Our theories generally fail to specify in any clear way what it is we actually do that is supposed to be effective. On the other hand, I find myself thinking that the hard line behaviorists are much more 'robotizing' in their approach to counseling than are those who work with computer systems. Computer systems thinking actually begins to bridge the gap between a 'hard' behavioral approach to counseling and 'soft' humanist approach.

My final reflection revolves around the image of the 20th century human being as he relates to the computer. I was struck by the deep, warm, and genuine humanness of our 'computer experts' Weizenbaum, Licklider, Jordan Baruch, and certainly Dave Tiedeman, to name only the major ones. For them computers seemed to have become colleagues to be taken seriously in the human quest for solving great human problems, primarily that of how we can educate people better than we do now. At the same time, the computer for them was not a giant out of proportion to the humans who control the situation. Dave's image of the computer in the mind of the human catches this feeling graphically.

To put it another way, the educator, counselor, or counselor educator of the 20th century must operate with a great self-consciousness about computers and their possibilities, as well as their limits. They represent a fantastically powerful extension of man's imagination. And for me, finally, what full 20th century humanness comes down to is the full, creative, and responsible use of the human imagination. It is what makes us human rather than not human. It is what created the computer in the first place. It is what decides what the computer can do."

Frank Wesley summarizes succinctly the issues for debate:

> "It is recognized that the installation of a computer-based system for use in the guidance and counseling process would be an expensive venture. Too, the attitude of the counselors involved would dictate to a great extent the success of such a system. There are some who question the feasibility of using such technical devices to solve purely human problems. The debate centers on whether or not the use of computers in systems approaches to guidance depersonalizes the relationship between student and counselor, or whether it is enhanced."

Wesley considers that "by providing the individual with more powerful media for exploring the meaning and information as it applies to him, and by permitting counselors and teachers to be the student's collaborators in interpreting the information, the new guidance systems may serve to expand rather than constrain personal freedom.

Richard Pearson, acknowledging the widespread belief among educators that systems applications will automatically dehumanize the process of education, contends:

> "The issue of system quality, through humanizing interaction although of eventual overwhelming importance, cannot really be assessed by educators until a commitment to explore technological potential is developed. It would appear that

the necessary 'open climate' remains only a distant dream. Obviously, the practicing counselor is going to be somewhat threatened by a machine invasion of his field. This problem permeates much of the local educational thinking.

It is apparent that massive programs aimed at providing educational exposure to technological advances are a vital necessity. To merely impose a machinated system on a local program will insure its failure, or, at best, delay its successful adaptation. In many respects the educator in the trenches is isolated from the developing technological frontiers, and finds his minimal understanding of computer applications a serious handicap to providing enthusiastic support for change.

In this regard, the presentations by Dr. Weizenbaum and Dr. Licklider and the ensuing discussions were most informative and enlightening. It is this type of dialogue which could do much to allay the fears of educators and yet impress upon them the necessary inevitability of adopting advanced systems."

Ronald Fredrickson sees the computer system as useful not only to the counselor or client alone but, more important, in consort. Fredrickson maintains:

"There is potential danger that some may perceive the machine as a substitute for desired meaningful interpersonal relations. It does not justify the use of the computers to establish an incompetent straw man counselor against which to compare or utilize the computer. The use of the computer must be seen as an integral part of the guidance program not a tangent or a substitute for counselor contact. Hopefully the computer will add to the quality of counselor-counselee interaction. Interaction as an act does not necessitate human involvement. We interact with nature, objects around us, and now, space. Interaction with a computer is an extension of that environment, not a diminutive experience subtracting from counselor or human interaction."

Writing of his own experience with the computer at the conference, Fredrickson continues:

"After working with the Information System for Vocational Decisions (ISVD) terminal for about two hours, I realized that the computer, even with this innovative and complicated ISVD program, provides <u>power</u> to the human being who uses it. The computer has no power unto itself. Greater yet, the computer memory banks and the process of inquiry into that data expanded a person's awareness and may foster inquiry from other non-computer memory sources. The counselor as a

> resource person is changed from one of quantity to one of interpretation and assisting the student in testing the reality of what he has learned."

Mock also sees the computer as enhancing human freedom and power:

> "I believe that the most important advantage of adding a computer to a counseling system is the responsiveness it allows the student. It establishes an approach that permits greater self-direction with the system under student control. The use of the computer also provides more time for counseling from counselors by reduction in clerical work."

If we can learn to view computer systems, not with suspicion and fear, but with the recognition that enhancing of power, self-direction and humanizing effects are possible, cautions such as Janet Jackson's alert us to real possible danger: "The possibility that automated techniques will impose an arbitrary set of generalized procedures in counseling, thus eliminating the variability that current procedures allow counselors in their approach."

Control of the system and procedures are not inevitably wrested from counselor and user by the introduction of automation, but the locus of this power and control must be jealously guarded. Flexible, responsive systems, more difficult to construct, generally can assure greater freedom and responsibility for the counselor and student.

Vriend raises the question of whether an uncaring machine, with no capability for emotion, can yet contribute to the counseling process which is presumed to rest so heavily on human interaction. If a computer can minister to the needs of the user, without itself showing emotion, it can "care" in the therapeutic sense of the word. Vriend contends that neutrality, rather than involvement, is often the most important dimension in the counseling process. A machine which is neutral and will not be side-tracked, may be programmed to be properly responsive and may perform some essential part of counseling more efficiently than a human being.

Weizenbaum extended this argument further, asserting that a neutral computer, free from the biases and pressures to which counselors are usually prey, can elicit a kind of trust and honesty from the user that few counselors could bring forth. With the absence of presumed counselor expectation and "set", a son of a professional could dare to explore a non-college course of action with a computer and a son of an unskilled worker could dare to dream and explore some course of further action involving leaping across the vast socio-economic gulf that separates classes in the United States.

But can one "trust" a computer? Will it be benevolent? The issue of privacy of files was raised but hardly resolved.

Imminent change in the field of guidance brought about by the introduction of the mere concept of the computer-assisted system brings to the fore these many issues of cost, reliability, threat to the counselor, depersonalization, enhancement or reduction of power, appropriateness for various segments of the population including the disadvantaged. Hollis raises yet another issue, closely related, and highly significant:

> "Technology makes possible a breakthrough. We can break out of our trap. The challenge ahead seems to be do we want Change (spelled with a capital C) or do we want to do something another way? Computers and other technology make possible not only change in the method (How), but also in the what we do."

THE POTENTIAL: THE GREAT PROMISE

After conferees had had the opportunity to interact with computers and to discuss some of the potential, many wrote of their visions of the future. Some could see the use of computers in their practice of counseling or in their school; some emphasized the integrative role computers would play in individual education and guidance; some envisioned the potential for research and growth in the field of counseling; some gave free rein to their imaginations, beginning to think of differences in kind in guidance and education.

Wesley wrote:

> "The computer is an example of a complex technological tool used in education. One of the most advanced applications to education is in its assistance to counseling and guidance. Computer assisted guidance has the promising future of providing the student with a greater range of alternatives for educational decision-making than is now possible."

He continued:

> "It is anticipated that the initiation of a computer-assisted system in Booker T. Washington Junior-Senior High School would permit the counselors to handle a higher level of individualized and diagnostic problem-solving with each student. Moreover, the counselors may be able to devote more time to professional counseling activities and less time with clerical detail and library work."

Fredrickson, too, anticipates that with less counselor time spent in decision-making, more time and effort would be expended in helping advisees make their decisions productive and satisfying. A new kind of vocational counseling would then concern itself with the adaptation of the individual to the world of work after he has made his choice.

Jackson envisions a computer-assisted guidance system with these advantages and characteristics:

"1. A major improvement in vocational decision-making, thereby resulting in more students vocational objectives being broadened, and hopefully more positive attitudinal responses toward the world of work.

2. Provide students with an immediate access to information for decision-making, a display of information appropriate to the perceptual frame of reference of the decision maker, and would have the advantage of maximal use of information from a total system.

3. Basically to allow the counselor, teacher and researcher to learn about individual students as they are in the process of learning.

4. Allow student to follow a sequence which fits his particular needs.

5. Facilitate learning at a speed and depth of understanding heretofore impossible.

6. Instant curriculum modification and evaluation possible.

7. Establishes an approach which permits greater self-direction with the system under student control.

8. Provide a greater amount of time for human counselor in the consultant role."

Sharing a similar vision, Mock foresees a variety of uses of the computer by the counselor in performing counseling duties:

> "The 1970's will usher in the use of the computer on full time basis at every level of education. It is hoped that guidance and counseling people will accept the challenge of this important new tool and direct its tremendous potential toward the most important function in the school ... that of guidance and counseling today's youth toward achieving their full potential.

> ... I believe that computers can do much toward individualizing education and thereby release counselors for other guidance functions that they have to perform. In the field of vocational education, the computer can facilitate the choice of an occupation by a student at a speed and depth of understanding that now seems impossible. With the computer a student follows a sequence of selections that fits his particular needs."

Other counselors also see the potential of the computer in relieving them of duties such as data retrieval and record keeping, allowing them to achieve higher goals in counseling and Oberteuffer even looks forward to "more time at home and in personal recreation." She is enthusiastic about the potential of programmed "Life Career Games" for individuals and counselor-led guidance and counseling classes or groups.

Caudle specifies his vision of the potential use of the computer in his setting:

> "While observing ISVD, I could visualize a youngster from Quincy for example, who was interested in welding, plumbing, metals and machines, or food service, to ask the computer about the job possibilities within the Quincy area. The student could actually visualize on-the-job slides from General Dynamics, Boston Gear Works, and Howard Johnson. We have been using slides that were presented to the Guidance Department by local business and industires showing recent high school graduates currently employed.
>
> The area of health careers for example could depict slides of job classifications in local hospitals where almost every student has visited and the jobs could be recalled in the mind of the student."

Coia expresses her view of the possibilities presented by the computer and even considers the possibility of being replaced by one:

> "Upon exposure to the systems, my initial reaction was curiosity and an eagerness to try them. As I did so, I began to see possibilities for further expansion, such as more interaction, voice contact, additional data bases. ISVD appears the most promising of the systems because there is more interaction. I can see potentialities for use as a tool. That is a use for the present -- today. As far as the future, who knows? It certainly doesn't bother me to have a computer interact in a 'counseling' context. Maybe for some cases the computer might be better than I. Perhaps my job may eventually disappear, but I'm not worried about it during my lifetime. Maybe that is a selfish viewpoint, but I hold that

whatever man does is for his own betterment, and maybe human counselors are not needed as much as they like to think, especially if there is some better way."

Smith, too, maintained that in some circumstances the computer might be a welcome replacement for the counselor.

"It also occurred to me as I participated in the demonstrations that there may very well be many young people who much prefer to reveal their 'innermost thoughts' to a computer rather than to an adult, -- especially if there has not been established unusually good rapport between the counselee and the counselor."

The enthusiasm of Dworkin was expressed by others in their euphoria phase:

"Thank you so much for letting me share an exciting week with you and the others. I stood on the threshold of a new era for guidance and counseling. I saw the potential capacities of man for helping other men extended much further. As I attempt to stand back and reflect over what transpired during that week, I see so many implications of the computer for our field that I am almost overwhelmed."

Some educators seem convinced that the computer will play an integrative role in guidance and education.

"There is no doubt in my mind that computer-assisted systems will become an integral part of education during the last three decades of this century. The computer is destined to be a part of the life-style of students in our middle and upper schools, and in our colleges,"

Roy comments.

Love spells out how the computer-assisted guidance systems can be integrated in an over-all program.

"The ES '70 program is one that seems to rely heavily on the computer for instruction, management, programming and scheduling research, and for guidance. Since the curriculum is individualized, information relating to each student must be stored in the data bank in order for accurate records to be kept of the student's progress. Therefore, the computer is a storehouse of information from which relevant and perhaps predictive information may be obtained for an individual student. At the same time, information regarding the student's particular or best learning style may be obtained. This will be a valuable tool for the

counselor, the teacher and the student. The ES '70 program is also involved with the vocational aspects of the curriculum, and a truly integrated curriculum will combine the vocational with the academic. We hope that this will lead to the development of a salable occupational skill. You can see, then, why I became so interested in ISVD because the system, as you have outlined, will certainly be of great assistance and value to a user in our ES '70 school. I particularly like the Systems Scripts which allows the inquirer to select a part of the system for investigation. However, all of the components of your system seemed designed to enable the inquirer to make the best possible choice for his career.

I also like the fact that there was active student involvement in the system, and this was not divorced from human interaction.

I must admit that I was also impressed with the ECES at the IBM building and the portable ILS that was exhibited in Cabot Hall for similar reasons."

Moore seems to share much of Love's vision of the future integrating guidance and education, but he would somehow like to push beyond this vision, which he describes as still "constricted".

"The American Institute for Research PLAN system again seemed to excite many participants with its educational philosophy and its subsequent implementation projects that were tuned in on the total educational system with a systems focus. Activities of this system, plus the innovative ES '70 school network programs, will begin to provide a climate conducive to giant steps in individualized instructional systems. While it is hoped that change will encourage change, I hope the concept of what is change is not limited to these 'here and now' change representations. As the ECES system might come to represent how the computer can be used in vocational guidance processes, and thus tend to limit exploration into other systems, ES '70 type innovation may come to represent what change is and similarly limit change to processes initiated by teachers, counselors, and administrators. My reaction to the systems employed by the practitioner-oriented presentors was one of easy assimilation and accommodation because their point of departure is similar to my background of experience. As I identified with the role of the teacher, counselor, or counselor educator, I found myself reaching in an interested but comfortable fashion to the PLAN and ES '70 proposals. In contrast, the Tiedeman group, plus Weizenbaum, Licklider, and Baruch, was appreciated best from the viewpoint of an individual who might have some future man-machine experiences or whose children may have these experiences.

> While even the most innovative school system that I could imagine tended to constrict my response to an interactive machine system, concentration of the human-machine possibilities as it could contribute to my own self-exploration of my children's personal development triggered almost fanciful, science fiction-like fantasy on 'what could possibly be.' The combination of fabricating a grossly different and incongruous mode of self-exploration, plus the realization of the means of how it could eventually come into fruition, gave me a sense of excitement, but uneasiness."

Moore is critical of the "machine" concept but expresses what potential does excite him.

> "For me, the concept of 'machine' interfered with the appreciation of the Tiedeman group postulates. The great possibilities of self-interaction, contextual interaction, and self-contextual interaction do not seem to be best represented by the 'machine' concept. In the last session of the conference when man was graphically represented with a 'machine' in his head stimulated me to reflect on what would be my next representation. In addition to placing other people in the picture, such as Rhoda Baruch interjected, I would have drawn a man and environment-context within the machine. Again for me, the 'machine' is not the thing. The fabulous potential lies with our ability to extend our humanness and environment by capturing our past, simulating our future, conjuring context and creating self (feed forward). I really could care less that a machine was allowing me to do this."

Hollis' imagery also involves a man-environment interaction and he makes this point:

> "Technology is beginning to make possible for man to try out his potential environments while remaining in the here and now of the old environment. In addition, the try out can be done without the social threat of any other known means.
>
> Technology and the systems concept really makes possible man's extension of the human system."

Oberteuffer, too, envisions extension of the human system. She writes of "sensory extenders" and in addition she sees the potential of the computer in elevating education and guidance well beyond its present level. Oberteuffer sees

> "The potential, then, for wise and wonderful men to build a theory and its paradigm into a program that has the potential

of educating (in the best sense of the word) students of all ages, with the cooperation of the sometimes less well prepared and less mature teachers, far better than the teacher could. This, I submit now that I've seen the distant gleam of Dave Tiedeman's dream -- is the only way that the mediocre general population of the 1970's will be able to lift its progeny at a rate far faster than usual (at a time when it is desperately needed) to a position substantially ahead of the traditional shoulder-stand of 'next generations.'"

Cook sees beyond the computer's capacity for retaining and storage of information, another important and perhaps less expected value. Cook writes:

"Even as I set down this basic accomplishment of the conference I perceive a model analogous to the computer. As a retainer and retriever of information the computer is prodigious. That seems to be an undeniably important aspect of computers. So information retrieval was a part of the conference for me. But the other level at which I experienced the conference was analogous to another aspect of computer art. This was the opportunity to explore new horizons of my own imagination through the 'imaginal explosion that was provoked by being shoved up against some new images about computers.

For me this represented some 'image breakthroughs' regarding the role of computers in humanizing education and, yes, even guidance. As in most such imaginal breakthroughs I received this one as a liberating experience."

When Vriend gives free rein to his imagination, he conceives of an unusual, even fantastic, potential use of the computer, which goes beyond the use of language and images.

"In some distant day it may even be possible for a client to interact with a computer from a couch or similar comfort station so wired and instrumented as to feed emotional data into the computer simultaneously with the natural language being exchanged. One can imagine the machine-counselor of the future responding appropriately and effectively to every change in voice tone and speed, to the slightest restlessness indicated by body movement, to the most minute change in pulse rate, to moistened palms, to loss of eye contact, to all physical harbingers of affect, in short.

Where human counselors overlook such data, the computer would not. Where human counselors frequently confound and decelerate the counseling process in a rich assortment of erring ways, whether it be to inappropriately reinforce, to completely miss significant data, or to project their own

> feelings onto clients at grossly inopportune times, the 'ultimate' computer-counselor, with its lack of ego, with its built-in will to provide service, and with its never 'tuned out' listening capacity could become the totally attentive, effectively pansophic counselor for which any client might pray."

The visions of the future induced by the introduction of computer technology seem to range from the practical applications to counseling as labor-saving, to visions of highly integrated systems, also close to present practice and nearly practical, to grander visions of less clearly defined superior forms of education and ultimately to sublime newly conceived possibilities. Whatever the form of the vision, however, the computer-assisted system is viewed as showing great promise for the future.

THE GREAT TASK

We have been concerned with important issues raised by the introduction of technology into education, such as whether the effect will be to dehumanize or to enhance a sense of autonomy and individual uniqueness. We can become elated in our anticipation of the great promise of such a tool. We can become frustrated about the shortcomings of existing experimental imperfect systems. We can adopt, as Wesley suggests, one of several attitudes:

> "(1) We can refuse to accept the technologies under the presumption that they are an unorthodox encroachment on the humanness of American education; (2) we can remain indifferent and disengaged until the technologies are perfected; or (3) we can seek to shape the development of technology to anticipated educational needs. We take the position that educators must take the lead in developing the technology to humanize mass education."

Wesley accepts the challenge to use technology to do for students what they cannot do for themselves by giving them the freedom to choose and new alternatives to choose from. He would dedicate his efforts in education to produce men who are free to create new images of freedom.

But if we are to accept such a grand purpose, and seek to press computers into service in pursuit of these goals, then, as Vriend points out, "disorganized, foggy thinking simply will not do. If, as Francis Bacon so long ago showed, the simple act of writing produces a more exact man, then writing programs and scripts for computers certainly compounds and heightens the exactitude."

Weizenbaum addressed this problem of confronting the limits of our knowledge and Pearson comments:

> "The interesting dichotomy in the approaches of Weizenbaum and Licklider concern the difficulties in development of computer utilization. Dr. Weizenbaum stressed the necessity for a careful analysis of theoretical foundations as they evolve into the day to day activity of any professional group. This indeed is a stringent requirement, but seems to reinforce Dr. Tiedeman's concerns about the final application.
>
> On the other hand, Licklider seemed to gloss over that technicality in favor of a more straightforward approach -- it can be done and will be done, so let's get at it. In all honesty, the Licklider approach would appear to better stimulate the adventuresome spirits among us as opposed to the fear and feelings of inadequacy generated by Weizenbaum's demand for theoretical clarity. The frustrations and anxieties created by Weizenbaum's demands may, however, be essential ingredients for the generation of any forward thrust."

Reflecting further on this matter of the need for clear understanding of a process as a prerequisite for automation, Pearson continues:

> "If, as Weizenbaum stated, educators must thoroughly outline their theoretical foundations for operation to develop a competent machine system, then I can only feel ECES and ILS are inadequate systems, for they are not truly developed from theoretical notions.
>
> By definition, all three systems maintain an interactive mode; however, the interaction is limited, structured and lacking capacity in the ECES and ILS systems. Without potential for counseling interaction, the system will ultimately fail to relieve the counselor's furdens as fully as might be possible with ISVD."

Oberteuffer responds to the challenge, maintaining:

> "People such as the active, bold, and able ones at this conference should accept the responsibility, I believe, with which this conference charged us: become involved in order to help develop and guide the counseling, guidance, and curriculum applications of computers we need and that business enterprise will produce with or without us.
>
> The computer scientists like the two or three in Thursday's program have whetted my appetite for a clean-cut, vigorous, logical theoretical base for counseling. The machine requires

> this in order to be programmed; but more than the end -- programmable; I would find, I believe, great personal satisfaction and the added value of increased effectiveness in the clarity and explicitness of such descriptions and understanding."

In contemplating the introduction of automation, one is all too soon confronted with the obstacles presented by the limits in our knowledge. In counseling and guidance, especially, we face such a problem.

> "There has been a notorious lack of specificity, a generalized reluctance on the part of counseling practitioners to function in such a way as to bring about specified behavioral outcomes. When neither a desire nor a recognized need to pin down and structure objectives and sequential steps leading to these is felt by professionals in the field, the development of both theory and practice remains at a standstill," Vriend contends.

The problem of specifying the bases and process of guidance and the solution to this problem are, curiously enough, intimately related. Wesley cites Helm (1967), who helps clarify this relationship. Helm suggested that "black box" model of the counseling process using a computer to facilitate the clarification and testing of the counseling theory. Wesley reports: "the black box" model consists of three components:

> "... input, a procedure (inside the box), and some output. He [Helm] pointed out that writing computer programs to simulate the counseling process would be a major technical difficulty. On the other hand, he suggested that if the 'black box' model of the counseling process were considered to be at least moderately reasonable, then computer simulation techniques using the model would be tremendously useful in helping the guidance researcher to develop comprehensive and testable models of the procedures concealed inside the black box."

An iterative process can be begun, before full revelation of a theory or model of procedure is achieved.

Vriend too sees the computer as aid and ally as well as challenger in the process of developing counseling research. He suggests:

> "One of the difficult problems in counseling research is determining to what degree results are due to a given method rather than to how a given person has interpreted and executed that method. This is one area where the use of computers holds such promise: studies involving the computer

> can be endlessly replicated with a total reduction of those contamination effects which are due to differences in counselor behaviors. The reaction of a machine to its subject is constant."

If we accept the challenge of incorporating the computer into our system of education and counseling, we come upon our severest critic and task-master. The computer can automate the process of our making fools of ourselves. It can spot-light and magnify our ignorance. Acknowledging the limits of our "science", the computer can assist us, through systematic research, to reduce that ignorance. Accepting the great task brings with it, in turn, a new and great promise -- to clarify and increase our knowledge of what is important and effective in counseling and guidance. We are presented with a laboratory of extraordinary educational value.

IMPLICATIONS FOR THE PRACTICE AND EDUCATION OF COUNSELORS

"The great promise versus the great task was a constant paradoxical theme," notes Moore at the conclusion of the conference. It is likely, as Lister suggests, that

> "Computer applications to counseling perhaps make counselors and counselor educators uncomfortable because the 'if-then' language required to proceduralize counseling quickly exposes the inadequately conceptualized theories upon which so many of us operate. Attempts to program relatively simple aspects of counseling illustrate the complexity of the process and the comparatively small portion of the counseling process which is accounted for by explicit conceptualizations which can be proceduralized. Computer applications in counseling will necessitate some reconceptualizations as efforts are made to operationalize theoretical constructs. This should be welcomed by counselors who seek a more adequate conceptual and operational base for their work with students."

Hollis, Chick, Moore, and Cook all echoed a theme of concern about inadequacy of the current status of theory and understanding in the counseling profession and about the inadequacies in the preparation of counselors.

Hollis acknowledged the absence of ready answers in designing new programs for the preparation of counselors in the new "era of individualized education." He wrote:

"The interaction I had with the various participants, ideas, machines, etc., during the conference made me come to recognize that counselor preparation, programs, even the best ones, are not facing the programs of 1970's and 1980's. At this point I lack a new philosophy and/or theory that is comprehensive enough to enable me to suggest a program to achieve the changes necessary. My eyes, ears, brain, and feeling level will be actively engaged in trying to find, in part if not in total, a counselor preparation program that will have potential meaning to tomorrow's counselor as he prepares today.

As I see it we have a challenge in personalizing while individualizing in education. Personalizing depends upon individualizing but the opposite is not true. Recognizing the move toward an individualized education era, then counselors have an opportunity and a challenge to help personalize the process."

The reflections of the counselor educators and some few counselors who discussed this issue are of two separate but related issues: implications for the changing functions of the counselor and for changing the preparation of counselors.

As for the anticipated changing part to be played by the counselor, several words of caution were offered. Dworkin warns:

"Of one thing I am certain, if we in guidance and counseling are to experience growth and development in our profession, we must be open to and integrating with our environment. This does not necessarily mean taking on new roles, which has been an issue in our field almost since its inception, but rather using a variety of innovative methods to help others develop along many dimensions."

Lister begins his reflections with caution but goes on to consider what new roles are in store for the counselor and what new functions and characteristics can be specified for the counselor and for the computer as well:

"As a counselor educator I was impressed with what appeared to be strong sentiment against going 'too far' with computers in guidance. This reaction could be expressed: 'The computer's a wonderful tool, and it can do a lot to aid the counselor, but remember, it's just a tool. Computers will make the counselor's skills more rather than less important.' Perhaps. Or possibly imaginative use of the computer will force a serious rethinking of what it means to use a tool, to counsel, and what are the counselor's indispensible human contributions to the helping process.

We naturally become uncomfortable with any invention which threatens us with replacement and obsolescence. The computer can certainly do well the tasks which consume much of the working day for many counselors. If the 'typical, routine' tasks were removed, how would counselors then spend their time? Would they counsel? Consult with teachers? Conduct research on the adequacy of the guidance programs? Or are many counselors actually now doing the things with which they feel most comfortable and might the computer force them to face their limitations in the human reations areas of guidance?

Counseling thus conceived requires the presence of a warm, empathetic flesh-and-blood counselor at some point in the process, however much may be aided by the computer or other tools. When the counseling process is anthropomorphized, there is reluctance to test the limits of the computer in counseling. Since the computer can only assist the counselor or do some difficult but psychologically peripheral function, much of the potential contribution of the computer may be overlooked. It would seem more profitable to ask the question the other way around: What are the benefits we hope students will realize from guidance, counseling, or education and what are the most effective means -- human or hardware -- for producing those benefits? Asked in this way the question leaves open to experimentation the relative contributions of man and machines to human ends."

Counselors can play an important part in the introduction of computers into the field, in a still tentative and experimental approach. Roy writes:

> "Are counselors presently working with students utilized by programmers when they plan systems and prepare scripts? It is my belief that counselors who daily help students make decisions regarding vocational and post high school training or education should be able to contribute much to education and guidance systems. This, of course, will be true only if the counselor has acquired an understanding of the needs and concerns of that sector of the population expected to use such systems, and in turn, is able to translate this understanding into procedures which can be integrated into a computer program. This will require, among other things, a thorough analysis of the components of what is usually referred to as the 'student-counselor relationship.'"

The counselor's participation in the planning for the utilization of the computer would likely necessitate the following kind of measures suggested by Chick:

> "What is needed in the profession is a thorough orientation for every counselor to the present state of knowledge of computer science and to the potentials of computer systems for the future. In this respect, the ACES standards proposed to the profession need to be revised so that every student in a counselor education program will have some degree of orientation and exposure in this field."

Considering this new role of the counselor, a creative role in implementing computer-assisted systems, Roy suggests orientation programs for practicing counselors -- a kind of continuing education to be offered by corporations interested in marketing computers as well as by universities with the technological knowledge.

Chick sees this "technological approach" to counseling as a help in redefining and adding to the professional stature of the counselor.

Cook was prompted to think about the analogy between the counseling process and computer processes, and in the course of these reflections, he reports, he began to see more clearly how the counselor is in a special sense a teacher. He writes:

> "I began to sense some of our insularity from other aspects of education to which we should be intimately involved. High on this list would be curriculum and instruction. There has been an enormous investment of time and energy within our profession to divorce the counselor from any retionship to the teaching function ('the counselor is not a teacher' goes the refrain). Yet I begin to see more and more clearly that the counselor is preeminently a teacher -- though a teacher with a difference.
>
> If people learn about themselves and their world through interaction with counselors or computers then there is surely a teaching function involved in that interaction. The computer helps us confront this part of our activity."

As a counselor facing the advent of computers in her field, Coia writes:

> "I am convinced that I don't know very much about computers, technology, or programs, but I'm willing to learn. Bring on the computers, I'm willing to use anything that will extend my limited capabilities to assist human beings."

There would appear from all the precedes to be a widely held belief that computers will change and upgrade the practice of counseling, integrating guidance more closely with teaching and curriculum development, relieving counselors of more routine chores so that they can be free to respond to students with more personal concern, and challenging counselors to play a creative role in implementing computer-assisted systems.

A rather self-evident corollary is pointed out by a number of counselor educators. As Cook puts it:

> "If the role and function of the counselor in the school is to be changed radically in the future then certainly counselor education is in for the same radical change. As I see it at this moment, we must finally begin to concentrate on the 'education' part of our role and begin to ask ourselves how it is that we teach (educate) people to become counselors. If the computer is the most powerful educational tool at our disposal then we have got to begin using computers. If individualized education is an innovation that maximizes learning potential, then we must begin individualizing our counselor education programs. The first thing to go will have to be the basic structure of the university system of education -- the course and the course credit as the basic learning unit."

Lister pursues a similar line of thought:

> "Counselor educators need not be highly imaginative to see that computer applications could revolutionize counselor preparation. For example, the didactic portion of the curriculum could be computer based or presented as individual learning packages, obviating the need for 'courses'. The use of games and simulation could provide students with opportunity and role implementation. The more explicitly the goals and processes of counselor education can be stated, the greater will be the immediate applicability of computer systems.
>
> Counselor educators and those they educate must be capable of responding to and shaping the accelerating change in American education. The roles of counselor and counselor educator will not remain static, so the task of educating counselors for roles which may not yet exist becomes a serious one. Our greatest challenge as counselor educators may well be that of preparing our students to live comfortably in a profession in which no method, technique, or professional role is immune from obsolescence."

Caudle makes several suggestions for the preparation of counselors:

> "After having observed the demonstration of ISVD, I could see the counselor-educator saying, 'With the application of this tool to counseling, we need to take a new look at our current course offerings.' From the demonstration, a definite need for a guidance programmer, a guidance counselor to assist the student with the tool and an individual to help the student with his emotional and academic problems. This would involve the individual to examine the phase of counseling he would like to be involved in, that of computer programming and technology or in the area of social work."

Cottingham has provided us with the following well-conceived analysis on the implications for counselor education.

"Implications for Counselor Education

A. Basic Thrust of Counselor Education

The basic thrust of Counselor Education programs must include an expanded experiential awareness objective to accommodate the impact of computerized guidance systems. This increased openness in the area of affective acceptance must be followed by operational implementation by Counselor Education units. The primary focus of future counselor education programs should include a greater emphasis on pervasive and variable approaches for looking at man and his interaction with his environment. This component is a factor in implementing the counseling process regardless of educational settings.

B. Orientation and Philosophy

The viewpoints of Counselor Education faculty will of necessity be broader as well as more functional in nature. Faculty members will develop a greater sensitivity for change not only in philosophical orientation but in operational mechanics. This will necessitate a concept change which in turn will mean a constant renewal or reorientation on the part of Counselor Education faculty members. By the same token as the educational concepts of the faculty are broadened, a concomitant broadening of the nature of learning will also take place. This includes not only a greater emphasis for accepting new methods and approaches but increased use of behavioral objectives for counselees on the job and trainees in Counselor Education programs. These behavioral objectives will presumably be at the immediate goal level as well as centering upon an intermediate and ultimate aim. The 'model function' of Counselor Educators as open and accepting, yet technologically informed individuals, will be greatly intensified in the future.

C. Curriculum Changes

1. Experimental-Didactic Features

Greater use will be made of packaged or learning unit materials for use by trainees. The increased learning possible through didactic learning units will permit greater breadth of program experiences as well as

greater depth in special areas. Programs can be more carefully tailored to the job needs of trainees.

2. Practical-Pragmatic Aspect of Counselor Preparation

Through the use of programmed materials students will be better prepared for both field and laboratory experiences. This will be accomplished through the use of more case study materials and laboratory type learning experiences for individual use by trainees. By the same token a wider range of laboratory and field experiences will be needed to acquaint students with the diversified use of technology on the job. Students will enjoy a new type of supervision including a greater use of technological facilities for micro-cosmic feedback from both laboratory and field experiences.

3. Experiential -- Intuitive

Because of the availability of technological facilities for didactic and field experiences, greater time will be available for a very necessary expansion of the individual and group encounter concept. Thus, more time will be available for helping a student develop his own personal qualifications as a vital dimension of the counseling process.

4. General Outcomes

The impact on counselor trainees will be felt in a greater individuality in planning by the use of carefully integrated components in the counselor education experience. Students will enjoy a wider range of skills both in terms of the technological aspects of behavior change and in personal capacities. Presumably, students will be more open to change in others as a result of their contact with a higher awareness level on the part of counselor education practicum experiences. The total counselor education experience hopefully will be a more balanced integrated experience both enriched and deepened by the use of technological resources combined with more sensitive human interaction.

D. Counselor Education Settings and Conditions

Counselor Education programs will by virtue of available time for student relationships develop a more intensive contact with community learning centers as service areas. At the same time these interactions with the community

> will take on both an interdisciplinary and a practical aspect based on evolving theoretical positions derived by Counselor Education programs. Research emphasis will move into new domains both in terms of counseling process and content, but in terms of applying technological developments to the broader segments of society. Some difficulty may be experienced in counselor education program management due to the increased demands of equipment, space, and technical personnel. Physical facilities will also necessarily be modified. The emphasis will be upon multi-media centers and variability in learning experiences. Student admission policies will reflect a greater concern for openness or receptivity to technical change as well as to the range of experiences needed to fit the candidate for individual placement. The contacts with other educational personnel will be enhanced as common goals are undertaken. While some distinction will continue to exist between teachers and counselors with respect to differentiated roles and functions many common areas and skills will be developed."

We see in Cottingham's proposal for counselor education an incorporation of many of the concepts used in Project PLAN and in ES '70 programs, an interesting example of cross-fertilization from the conference. Not only will counselors be expected to acquire a new range of skills, but in their acquisition, individualized instruction, learning packets and modules, and behavioral objectives will play a part. A change in philosophy as well as a broader base of methods is called for in both counseling and educating of counselors.

RECOMMENDATIONS

Among the recommendations that have come out of this conference, some have a more visionary quality and would perhaps be as appropriate in the section on the great promise or the great task ahead. Others have immediate implications for action and programs, as we shall see.

Oberteuffer calls for a team of the ablest intellectuals, psychologists, and educators to work on programming the "cognitive aspects of learning," using the most viable laws of learning, with many branches for accommodating individual differences, and such programs to be made available to all students. This implementation of organic curricula and individualized instruction would then be combined with a second emphasis, an AA '75 or "attention to affect" which would become the popular goal of 1975. This "attention to affect" calls for another team, this one of wise humanists, to use gains in interpersonal methods to

increase the rate of personal growth of teachers and counselors. Such newly trained school personnel, serving as models of relationship-developing people who are open, accepting, loving people would become the facilitators of the student's personal and intellectual growth.

With regard to the development of systems similar to the ones exhibited at the conference, many recommendations were made. Erickson, for example, writes:

> "There is no doubt in my mind that we need to continually upgrade our techniques in counseling, and relate them to all the new developing patterns in education. To me it is essential that continued research be carried on, and I feel the data processing field is one of the most promising. I think therefore that these projects should be continued and further explorations made.
>
> At this point, I have no particular reactions as to the various systems described. It seems to me all have potential -- that elements of the various programs may be eventually combined -- but all need further development.
>
> The major obstacle to implementation of any system to be developed is cost. Somehow we need to overcome some of the problems of finance so that developments of this kind may be available to the small and poor schools as well as the large and affluent ones. While this should not deter the development of new systems, I do hope that there will be exploration of ways and means by which the eventual implementation may be much more effective."

He sees virtue in a set of diverse approaches at this time, with ultimate combining of elements of various programs.

Vriend, too, calls for continued efforts such as those described at the conference. Vriend states:

> "In reviewing the ISVD and ECES, it became apparent to the conferees that the efforts of the developers represented important new attempts to sift and clarify a number of theoretical constructs in counseling and guidance, to translate these into sub-systems of functions which could be operationalized through the employment of highly sophisticated mechanical aids, and to relate these to a larger system, the on-going guidance services of a school. Certainly the counseling field needs more of this kind of hard thinking, of the application of scientific knowledge and methodology to the problems of producing effective guidance practices."

Oberteuffer, Coia, Lee, Caudle, Wesley, Roy -- indeed virtually all conferees involved with the schools called for further pilot projects and field tests. Ross comments on her perception of the field tests:

"The information presented to us in terms of the field trials is disappointing because it appears that the areas utilized in these trials are not indicative of the majority of school districts in the country. These machines must be tested in different types of school districts and a reliable run conducted in many of them, including areas that come under the heading of 'culturally deprived.'"

Wesley elaborates this point in terms of his particular school:

"Since a majority of the students (approximately 90 per cent) at Washington terminate their formal education at the high school level, strong emphasis is placed on the vocational aspect of guidance and Vocational training, which enables students to develop job skills, is open to all students. This training is conducted among the 'cluster of occupations' concept.

The activities described, which are included in the guidance program at Washington, are all carried out manually. Additionally, the counselors must collect, organize, and use large amounts of detailed information about many different students and many different vocations. The information processing task has been greatly complicated by growing student population, the resultant increase in student participation, and a rapidly changing pattern of vocational fields. Consequently, greater amounts of valuable counselor time are spent in gathering, processing, and maintaining fairly routine information, so that each counselor has less time for such vital activities as the face-to-face interviews with individual students.

A partial solution to this problem of information overload is the introduction of information-processing technology. Steps in this direction are already evident, as witnessed by the widespread use of test scoring machines, mark sense cards, punch card systems, and electronic data processing machinery for the recording, storage and retrieval of student information. Development in computer-based information processing makes application of information processing procedures to a wide range of counseling functions technically feasible. Therefore, we take the position that a computer-based system for guidance and counseling services would unequivocally serve the purpose at Washington."

Mock also recommends a computer-assisted system be introduced into her school, and she considers starting with the simpler system even as the more complex is further developed and integrated with ES '70 gains. She writes:

"I recommend that the directors of both systems approach the directors of the ES '70 schools concerning the possibility of doing additional field testing of the system in the six school represented at this conference. I believe Booker T. Washington would endorse this idea.

...I believe that its [ISVD's] effectiveness in a counseling situation will depend upon the quality of the script and the expertise of the script writer or programmer. It will be necessary to keep an adequate up-to-date file of data. I think the system is very good and can be used advantageously in the counseling program. One of the factors to be considered in evaluating this system is the full expense of installing it and operating it.

I feel that the ISVD could be used effectively at Booker T. Washington High School. Of course, the expense of installation has to be taken into consideration. It will help with the individualizing of education and give counselors released time to perform other guidance chores.

The Educational and Career Exploration System (ECES) does not seem to be as complex or complicated at the ISVD. I feel that it could be introduced as a beginning computer for use by students and counselors in any high school. Since it has been field tested with only one high school in New Jersey and with a relatively small number of students, it is difficult to predict what impact it will have on students using it. However, I am inclined to believe that students can and will learn a great deal about occupations. It will give counselors more release time to perform counseling chores.

Booker T. Washington could use the Educational and Career Exploration System very effectively with its students beginning with the eighth grade where students make their four year plans, and in the 9th, 10th, and 11th grades. The problem would be the high cost of installation and maintenance. Then there is the problem of the quality of guidance materials to be used with the computer. In other words, there would be a necessity of constantly updating the materials from time to time."

Roy has a suggestion with regard to improving the quality of guidance materials: it

"..involves the use of students as resource persons by programmers. There was no evidence that students had been consulted in this way by the creators of any of the systems observed. I feel that students could make a meaningul contribution to the systems if given an opportunity to share some of their concerns and language patterns with the professional programmer. Boys and girls currently in secondary

schools might also have some original ideas for career games. Students used in this way should be a real plus for computer-assisted systems designed to be relevant to the 'disadvantaged' or 'culturally different' youngsters."

With the design of new systems and materials, Fredrickson suggests we be wary:

"Much is said by young and old today about the hypocrisy of our society and its schools. School counselors as a group and often times as individuals are seen as part of that that phony game of meaningless education. Students have learned to play the 'real life educational game' and will learn to play any computer experience we develop unless we as counselors and educators use the extra time and energy the computer gives us to plan and implement an education program that is more meaningful and self-fulfilling. We do not gain very much if we simply jump from one game to another only changing the form."

Student power and participation is emphasized by Fredrickson:

"The ability to ask appropriate questions becomes more important with the advent of computers. Programs built into computers must be examined and questioned by the student just as a good teacher must encourage question among his students. The rationale and the purpose of the programs in the computer must be open to the users. Students, if not made clear to them by other sources, must be able to question the computer routine so that no secrets are kept from the student. Students need early exposure and instruction in computers and additional stimulation in asking appropriate questions of the machine."

Could other technologies be substituted for the computer, ponders Smith and he writes:

"Aside from all of the mechanical considerations, the concept of computer use for many aspects of counseling services, is one which merits attention and further refinement. It would appear that it could make a real contribution and make it possible for counselors to have the time to do the jobs which only they, and not computers, could do.

The over-riding impact of the conference on my thinking was that the demonstrations proved conclusively that it is not only possible but feasible for computer programs to remove a good deal of the more or less mechanical and routine work from guidance counselors. The computer makes possible much more readily accessible information about students and career opportunities than any counselor could possibly master.

> Throughout the demonstrations, I kept asking myself whether or not the same result could not be obtained through use of visuals with large groups of youngsters. The conclusion I arrived at was that while it was possible that some of the preliminary work shown in the computer programs could possibly be handled more effectively through large group visual presentations, the end results -- where the computer really interacted with the student -- could never be handled in a group situation."

Caudle, too, hopes

> "...that ISVD can be incorporated in many of the programs that are currently being conducted in the ES '70's school systems and that Quincy is one of the school systems selected."

He can see a system incorporating Project PLAN components in association with ISVD. He recommends that a program such as ISVD begin in the intermediate grades and continue through the tenth grade. He prefers real, rather than simulated experience, for eleventh and twelfth grade students, who would actually visit local places where their career choices actually exist.

Another counselor who calls for an effort to combine Project PLAN and ISVD is Jackson. She writes:

> "First of all, there can only be minimal results from any educational plan that does not make provision for enhancing the disadvantaged child's self-esteem. Therefore, I should like to see a combining of the major components of Project Plan and ISVD to be used in a field test at our school.
>
> There is an urgent need for students at our school to develop an ideal self-concept, as well as a realistic self-concept. The combination of the two systems would provide the students with the necessary tools for enhancing their self-concept, as well as extending their vocational outlook."

Warren Smith writes of another kind of collaboration for continued efforts:

> "I believe both projects have made great strides and must be continued. I think that people like Dave Tiedeman, Don Super, Joseph Weizenbaum, and J.C.R. Licklider should be freed to think, analyze, synthesize and evaluate. Perhaps a marriage of their think power and the private sector's technical know-how would result in a systems design that would be competent, efficient, and economically feasible."

Other kinds of recommendations pertain to the conference and to the problems of disseminating information. More conferences are recommended, more counselors and school personnel to be involved, more sharing of information among developers of systems to avoid unnecessary duplication and prompt diffusion in the field; a recommendation somewhat contradicting another set of recommendations requiring adequate field tests and multiple and diverse approaches to systems.

The gains of several approaches can be combined, and staged in several phases of efforts as some participants have suggested.

Cottingham presents a concise set of what he calls "reactions to issues."

"A. Educators in the guidance area have no alternative but to accept the moral responsibility for responding to the challenge of broadening man's individuality through the use of computerized guidance systems.

B. Justification for the full development and utilization of computerized guidance systems rests on their potential for strengthening human resources through an expanded knowledge of man's understanding of himself, his environment, and their mutual interaction.

C. Individuals and organizations representative of the guidance aspect of education should assume leadership in developing both the philosophical climate and the operational conditions to implement the use of computerized guidance systems in Counselor Education programs and in consumer units of guidance services."

CONCLUSION

"The roller coaster of aspiration and disillusionment is amusing to the extreme conservative, who thought the aspirations were silly in the first place. It gives satisfaction to the left-wing nihilist, who thinks the whole system should be brought down. It is a gold mine for mountebanks willing to promise anything and exploit any emotion. But it is a devastating whipsaw for serious and responsible leaders."

John W. Gardner (1968)

No panaceas exist, we face only hard work and a continued struggle for sources of support to sustain the development efforts. The computer

can be an unprecedented aid and ally as well as a challenger and critic in advancing counseling research and counseling practice. In the development of computer-assisted systems, the locus of control must be securely placed with the student and the counselor-educator. With these principles, we can master the whipsaw.

APPENDICES

Appendix A

List of Authors of Reactions Papers at Conclusion of Conference

This conference report integrates the materials provided by these authors:

Caudle, Mr. Carter C.
Chick, Dr. Joyce M.
Coia, Mrs. Alma
Cook, Dr. David
Cottingham, Professor Harold F.
Dworkin, Dr. Edward
Erickson, Mr. Reynold
Fredrickson, Dr. Ronald H.
Hollis, Dr. Joseph
Iverson, Mr. Sherman
Jackson, Mrs. Janet
Lister, Dr. James L.
Mock, Mrs. Aster Lee
Moore, Dr. Earle J.
Oberteuffer, Mrs. Margaret
Pearson, Mr. Richard B.
Ross, Mrs. Lee
Roy, Miss Myrtle J.
Smith, Mr. Dana P.
Smith, Dr. Paul E.
Smith, Dr. Warren
Vriend, Dr. John
Wesley, Mr. Franklin

ERRATUM

Mr. George Love was inadvertently omitted from the list of Authors of Reaction Papers in Appendix A, page 48. His name should be inserted on that page.

Appendix B

Participants in the Invitational Conference on Computer-Assisted Systems in Guidance and Education

Co-Directors:
Dr. Rhoda Baruch and Dr. David V. Tiedeman
Harvard Graduate School of Education

Mr. Edward Banos
Guidance Director
John F. Kennedy High School
Willingboro, New Jersey

Dr. Nathan Brodsky
Director of Educational Programs and Management Training
Office of the Assistant Secretary of Defense
The Pentagon - Room 3D/264
Washington, D.C.

Mr. Frank Burtnett
Consultant, Bureau of Pupil Personnel Services
Pennsylvania Department of Public Instruction
Box 911
Harrisburg, Pennsylvania 17126

Mr. Carter C. Caudle
Department of Guidance and Research
Quincy Public Schools
Quincy, Massachusetts 02169

Dr. Joyce M. Chick
Associate Professor
College of Education
Department of Guidance and Counseling
Florida State University
Tallahassee, Florida 32306

Mrs. Alma Coia
Guidance Director
A. Levitt Junior High School
Willingboro, New Jersey

Dr. David Cook
Director, Counselor Education
Northeastern University
Boston, Massachusetts 02115

Professor Harold F. Cottingham
College of Education
Department of Counselor Education
Florida State University
Tallahassee, Florida 32306

Mr. James De Worken
Monroe Public Schools
503 Washington Street
Monroe, Michigan 48161

Dr. Edward Dworkin
Research Specialist
Center for Vocational/Technical Education
Ohio State University
Columbus, Ohio 43210

Mr. Reynold Erickson
Director of Guidance
Minnesota Department of Education
Centennial Building
St. Paul, Minnesota 55101

Dr. Ronald H. Fredrickson
Assistant Professor
University of Massachusetts
School of Education, Rm. 109
Amherst, Massachusetts 01002

Mr. William Hewson
State Department of Education
182 Tremont Street
Boston, Massachusetts 02111

Dr. Joseph W. Hollis
Director of Doctoral Programs in Counseling and Guidance
and Professor of Psychology-Counseling
Department of Counseling Psychology and Guidance Services
Ball State University
Muncie, Indiana 47302

Mr. Sherman Iverson
Director of Guidance
226 North First Avenue East
Duluth, Minnesota 58802

Mrs. Janet Jackson, Counselor
Booker T. Washington Junior-Senior High School
119 East 39th Street
Houston, Texas 77018

Dr. Brian Jones
Director, Guidance Research Program
American Institutes for Research
P.B. Box 1113
Palo Alto, California 94302

Dr. James L. Lister
Professor of Education
University of Florida
Gainesville, Florida 32601

Mr. George Love
Board of Education Building
Room 506
21st and Parkway
Philadelphia, Pennsylvania 19103

Mrs. Aster Lee Mock
Dean, Booker T. Washington Junior-Senior High School
119 East 39th Street
Houston, Texas 77018

Dr. Earle J. Moore
Associate Professor of Education
6 Hill Hall
University of Missouri
Columbia, Missouri 65201

Dr. Otty Norwood
Superintendent
Mamaroneck Public Schools
Mamaroneck, New York 10543

Mrs. Margaret Oberteuffer
c/o Miss Hannah Larsen
Supervisor of Counseling and Guidance
Portland Public Schools
631 North East Clackamar Street
Portland, Oregon 97208

Mr. Richard Pearson
Assistant Superintendent for Pupil Personnel Services
226 North First Avenue East
Duluth, Minnesota 58802

Dr. William Phillips
New Jersey State Department of Education
225 West State Street
Trenton, New Jersey 08025

Mr. Allen Platt
Board of Education Building
Room 705
21st and Parkway
Philadelphia, Pennsylvania 19103

Mrs. Lee Ross
Guidance Director
Willingboro Memorial Junior High School
Willingboro, New Jersey 08046

Miss Myrtle Roy
c/o Mr. George Love
Board of Education Building
Room 506
21st and Parkway
Philadelphia, Pennsylvania 19103

Mr. Robert Schwartz
Adams High School
39th and Killingsworth
Portland, Oregon 97211

Mr. Dana P. Smith
Guidance Counselor
Raey E. Sterling Junior High School
444 Granite Street
Quincy, Massachusetts 02169

Dr. Paul E. Smith
Superintendent
Boulder Valley Public Schools
P.O. Box 11
Boulder, Colorado 80302

Mr. Warren Smith
Director
Nova Schools
Fort Lauderdale, Florida 33313

Mr. Jack Stabe
Guidance Department
Central High School
Duluth, Minnesota 58802

Dr. John Vriend
Associate Professor of Education
College of Education
Wayne State University
Detroit, Michigan 48202

Dr. Gary R. Walz
Professor, School of Education
University of Michigan
Ann Arbor, Michigan 48102

Mrs. Patricia Wertheimer
John Adams High School
39th and Killingsworth
Portland, Oregon 97211

Mr. Franklin Wesley
Principal
Booker T. Washington Junior-Senior High School
119 East 39th Street
Houston, Texas 77018

Dr. John M. Whiteley
Assistant Vice Chancellor
Box 1116
Washington University
St. Louis, Missouri 63130

STAFF

Dr. Rhoda Baruch
Harvard Graduate School of Education
Longfellow Hall - Appian Way
Cambridge, Massachusetts 02138

Co-Directors

Dr. David V. Tiedeman
Harvard Graduate School of Education
Larsen Hall - Appian Way
Cambridge, Massachusetts 02138

Dr. David K. Archibald
Center for Educational Software Development
New England School Development Council
55 Chapel Street
Newton, Massachusetts 02160

Dr. Martin J. Bohn
Teachers College
Columbia University
New York, New York 10027

Mr. G. Brian Jones
American Institutes for Research
Station A. P.O. Box 11487
Palo Alto, California 94306

Dr. J.C.R. Licklider
Project MAC
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

Dr. Frank J. Minor
Advanced Systems Development Division
IBM Corporation, Inc.
Strang Boulevard
Yorktown Heights, New York 10598

Dr. Donald E. Super
Teachers College
Columbia University
New York, New York 10027

Dr. Joseph Weizenbaum
Massachusetts Institute of Technology
545 Tech Square - Room 809
Cambridge, Massachusetts 02139

Mrs. Sara S. Booth
Harvard Graduate School of Education
Longfellow Hall - Appian Way
Cambridge, Massachusetts 02138

Conference Arrangements

Miss Dale McCann
Harvard Graduate School of Education
Longfellow Hall - Appian Way
Cambridge, Massachusetts 02138

Reception Desk - Conference

Miss Nona D. Strauss
Information System for Vocational
Decisions
c/o New England School Development
Council
55 Chapel Street
Newton, Massachusetts 02160

Report

Appendix C

Conference Program

Invitational Conference on Computer-Assisted Systems
in Guidance and Education

Cabot Hall
Cambridge, Massachusetts

June 22-27, 1969

Sponsored by Harvard Graduate School of Education
and Teachers College, Columbia University

Funded by U.S. Office of Education

Living accommodations:	Meals and lodging provided at Cabot Hall, a Radcliffe dormitory located at 100 Walker Street, 354-9641, beginning with the night of June 22. Meetings, unless otherwise specified, held at Cabot Hall.	
Registration:	June 22, Sunday, from 5:00 P.M., at Cabot Hall	
June 23:	9:00 A.M.	Welcome and Orientation: RHODA BARUCH
	10:00 A.M.	Coffee
	10:15 A.M.	An overview of the Information System for Vocational Decisions (ISVD): DAVID TIEDEMAN
	12:00	Lunch
	1-5 P.M.	Demonstration and Discussions of the ISVD by Staff: ROBERT P. O'HARA, ALLAN B. ELLIS, DAVID ARCHIBALD, ROBERT AYLMER

June 23: (cont.)

1-5 P.M. Demonstrations held at the Homestead Motor Inn, Cambirdge, and at Longfellow Hall, 13 Appian Way.

June 24:

9:00 A.M. Introduction and Theoretical Background of the Educational and Career Exploration System (ECES):

DONALD SUPER

9:15 A.M. Design of Functions and Uses of ECES:

FRANK MINOR

9:45 A.M. Film showing students using ECES

10:00 A.M. Coffee

10:15 A.M. Preliminary observations of ECES field test at Montclair, New Jersey

12:00 Lunch

Afternoon Demonstrations of ECES:
at IBM
1730 Cambridge Street
Cambridge, Massachusetts
and discussion of ECES with staff:

DONALD SUPER, MARTIN J. BOHN, JR.,

FRANK MINOR

The Terminal at IBM will be operating until 9:00 P.M. on Tuesday, June 24.
The ISVD terminals will also be available by appointment.

June 25:

9:00 A.M. Project PLAN: Computer Supported Individualized Education

G. BRIAN JONES

10:00 A.M. Coffee

10:30 A.M. What Educational Innovation is About: ES '70 Panel:

GEORGE LOVE, FRANK WESLEY,

WARREN SMITH

June 25: (cont.)	12:00	Lunch
	1:00 P.M.	Man, Machines, and Understanding: Workship and Discussion of Conference Papers: Northeast Conference on Measurement in Education
		DAVID V. TIEDEMAN
June 26:	9:00 A.M.	The Computer: An Ideal Neutral Counselor
		JOSEPH WEIZENBAUM
	12:00	Lunch
	1:00 P.M.	ES '70 Programs
		OTTY NORWOOD, ROBERT SCHWARTZ,
		CARTER CAUDLE, RICHARD PEARSON,
		ALMA COIA, LEE ROSS
	5:00 P.M.	Cocktails
	6:00 P.M.	Dinner
	8:00 P.M.	J.C.R. LICKLIDER
June 27:	9:00 A.M.	The Forces of Change: Implications for Counselor Education Informal Panel
		The Social Revolution
		DAVID COOKE
		Computer Technology
		JOSEPH HOLLIS
		School -- The Educational Environment
		RONALD FREDERICKSON
		Implications for the Functions of Teachers and Counselors
		The ERIC System
		GARY WALZ

June 27: (cont.)

Philosophic Implications

ED DWORKIN

Implications for the Training and Selection of Teachers and Counselors

HAROLD COTTINGHAM

JOHN VRIEND

Appendix D

Sample[1] Protocol of Exchange between Student and ISVD

The Computer's output is upper case and the student's input is upper and lower case.

WHAT WOULD YOU LIKE TO DO TODAY.

I want to think about colleges to apply to next year.

SINCE WE KNOW THAT YOU HAVE NOT EXPLORED YOUR COLLEGE CHOICE WITH THE SYSTEM BEFORE, THE FIRST THING WE WOULD LIKE TO FIND OUT IS IF YOU HAVE THOUGHT ABOUT THIS CHOICE ENOUGH TO HAVE SOME ALTERNATIVES IN MIND. IF YOU DO, TYPES THE NAMES OF EACH OF THE ALTERNATIVE COLLEGES. IF NOT, TYPE IN THE WORD NO.

Harvard University, Boston College, Berkeley

GOOD. WHAT KINDS OF THINGS DID YOU DO IN EXPLORING COLLEGE CHOICE.
DID YOU READ ANY COLLEGE CATALOGUES OR TALK WITH YOUR GUIDANCE COUNSELOR.
MAKE AS COMPLETE A STATEMENT AS POSSIBLE.

I read the catalogue for Harvard and Boston College. I talked with my guidance counselor, and had a couple of interviews with the Dean at Harvard. My father went to Berkeley so that's why I'm interested in going there.

THESE ARE THE ACTIVITIES THE MACHINE HAS RECOGNIZED OR ANALYZED FROM YOUR STATEMENT. YOU HAVE DISCUSSED THE MATTER WITH MEMBERS OF THE FAMILY, SPOKEN WITH A GUIDANCE COUNSELOR, READ SOME COLLEGE CATALOGUES, SPOKEN WITH COLLEGE OFFICIALS.
HERE ARE SOME OTHER THINGS THAT MAY BE A GOOD IDEA TO DO IF YOU HAVEN'T ALREADY. YOU COULD HAVE DISCUSSED THE MATTER WITH A TEACHER. NOW THEN, LOOK AT THE LIST OF EXPLORATION ACTIVITIES THAT YOU PERFORMED OUTSIDE OF THE SYSTEM. HERE IS THE LIST OF YOUR PRESENT ALTERNATIVES.
HARVARD UNIVERSITY, BOSTON COLLEGE, AND BERKELEY. NOW TYPE IN THE ACTIVITIES THAT YOU FEEL HELPED YOU MOST ABOUT MAKING UP YOUR MIND OR GAVE YOU SOME ALTERNATIVE COLLEGES TO THINK ABOUT. PLEASE TYPE THEM IN THE ORDER OF IMPORTANCE.

The interviews and talking with my dad

GOOD. BEFORE WE GO ON TO EXPLORE COLLEGE CHOICE, WHAT ARE THE FACTORS THAT YOU THINK ARE IMPORTANT IN CONSIDERING WHICH COLLEGES TO APPLY TO.
ANYTHING ELSE.

---

1. This sample is an excerpt from an actual interchange between individual and computer and is given in Ellis and Tiedeman, "Can a Machine Counsel?", ISVD Project Report No. 17, December 1968.

Tuition costs, test scores

HERE ARE SOME OF THE FACTORS THAT OTHER STUDENTS FOUND IMPORTANT
(1) CURRICULUM CHOICE (2) COURSE SELECTION (HIGH SCHOOL SUBJECTS)
(3) GRADES (4) CLASS RANK (5) TEST SCORES (PSAT, SAT, CEEB, ACT)
(6) EXTRA-CURRICULAR ACTIVITIES (7) FUTURE VOCATIONAL PLANS (8) GOAL
IN GOING TO COLLEGE (9) POST COLLEGE EDUCATION AND/OR TRAINING.
HERE IS YOUR LIST.
GRADES, CLASS RANK, TUITION COSTS, TEST SCORES. LOOK AT BOTH LISTS
AND THEN TYPE IN ALL FACTORS FROM BOTH LISTS THAT YOU CONSIDER IMPORTANT
IN THINKING ABOUT COLLEGE CHOICE.

High school courses, grades, class rank, test scores, tuition costs,
future vocational plans

FINE. THERE ARE SEVERAL WAYS THAT YOU CAN GO ABOUT THINKING ABOUT COLLEGE
CHOICE WITHIN THE ISVD SYSTEM.
YOU CAN GO THROUGH SOME CONCEPT SCRIPTS WHICH ARE DESIGNED TO GIVE YOU
SOME FACTS ON TOPICS RELEVANT TO COLLEGE CHOICE. OR YOU CAN PLAY THE
LIFE CAREER GAME. USING THE DATA OF A MAKE BELIEVE STUDENT WHO IS LIKE
YOU IN SOME WAYS YOU GO THROUGH THE PROCESS OF SELECTING A COLLEGE FOR
HIM. IF YOU HAVE THE SPECIFIC COLLEGES IN MIND, YOU CAN GET DATA ON THEM
BY ACCESSING THE EDUCATION DATA FILE.
IF YOU LIKE, YOU CAN LET THE SYSTEM GUIDE YOU THROUGH A STATEMENT OF
PREFERENCES TO COME UP WITH A LIST OF COLLEGES THAT MOST NEARLY MATCHES
YOUR PREFERENCES. OR YOU CAN ELECT TO FIRST GO THROUGH A UNIT ON DECISION-
MAKING, A UNIT THAT TRIES TO HELP YOU UNDERSTAND YOURSELF AND OTHERS IN
RELATION TO MAKING DECISIONS.
WHAT WOULD YOU LIKE TO DO.

Access the education data file

YOU HAVE ACCESSED THE EDUCATION DATA FILE. FOR DEMONSTRATION PURPOSES ONLY,
THE FOLLOWING SCHOOLS HAVE BEEN IMPLEMENTED. HARVARD COLLEGE (MEN), GOUCHER
COLLEGE (WOMEN), BERKELEY UNIVERSITY (LARGE STATE SUPPORTED SCHOOL), BOSTON
COLLEGE (RELIGIOUSLY AFFILIATED), AND CARNEGIE INSTITUTE (TECHNICAL TRAINING
SCHOOL). THE FOLLOWING FOUR VARIABLES HAVE BEEN IMPLEMENTED . . . COSTS
(INCLUDING TUITION, ROOM AND BOARD, AND OTHER FEES), REQUIRED ENTRANCE
EXAMS, CRITERIA USED IN SELECTING STUDENTS AND REQUIRED HIGH SCHOOL COURSES.
NOW THEN YOU CAN QUERY THIS MICRO DATA BASE IN ANY WAY THAT YOU WANT.
PLEASE DO NOT USE QUESTION MARKS. IF YOU WISH TO STOP AT ANY TIME, TYPE
IN THE WORD STOP.
YOU MAY BEGIN.

How much does it cost to go to Harvard.

TUITION AT HARVARD IS 2000 PER YEAR INCLUDING LAB AND HEALTH FEES. ROOM AND
BOARD IS 1170 DOLLARS. NON-RESIDENT STUDENT FEE IS 25 DOLLARS. BOOKS AND
SUPPLIES ABOUT 70 PER YEAR. PERSONAL EXPENSES ABOUT 375 DOLLARS INCLUDING
ROOM SUPPLIES, CLOTHING, CLEANING AND LAUNDRY, RECREATION, AND OTHER
PERSONAL EXPENSES (EXCEPT TRAVEL).

How does that compare with Boston College.

BOSTON COLLEGE'S TUITION IS 1600, ROOM AND BOARD IS 1050 DOLLARS. OTHER COSTS INCLUDE BOOKS AND SUPPLIES ABOUT 100 DOLLARS, LAB FEE 100 DOLLARS AND 30 DOLLARS FOR WOMEN BOARDING STUDENTS FOR HEALTH FEES.

What high school courses should I take for Boston College.

NO SPECIFIC NUMBER OF UNITS IS REQUIRED, HOWEVER, THE FOLLOWING MINIMUM IS REQUIRED. ENGLISH (4), ALGEBRA (2), PLANE GEOMETRY (1), FOREIGN LANGUAGE (2), TRIGONOMETRY (1/2) (FOR STUDENTS PLANNING TO MAJOR IN MATH, BIOLOGY, CHEMISTRY, OR PHYSICS), BIOLOGY, CHEMISTRY, OR PHYSICS (2) (FOR STUDENTS PLANNING TO MAJOR IN THE ABOVE SCIENCES AND FOR APPLICANTS TO THE SCHOOL OF NURSING), ACADEMIC ELECTIVES (5).

What specific entrance exams are required.

BOSTON REQUIRES THE SAT AND THREE ACHIEVEMENT TESTS. ENGLISH, LEVEL I OR II MATHEMATICS, AND ONE OF THE CANDIDATE'S CHOICE.

Does Berkeley require the SAT.

APPLICANTS WHO ARE INELIGIBLE, DUE TO GRADE AVERAGE, OR TO UNIT OR DISTRIBUTION DEFICIENCIES, OR WHO HAVE GRADUATED FROM AN UNACCREDITED SECONDARY SCHOOL, MAY QUALIFY FOR ADMISSION BY CEEB EXAMINATIONS. THE THREE ACHIEVEMENT TESTS REQUIRED FOR THOSE APPLYING FOR ADMISSION ARE. . ENGLISH, ONE TEST IN SOCIAL STUDIES OR FOREIGN LANGUAGE, ONE TEST IN MATHEMATICS OR A SCIENCE. REQUIREMENTS FOR CALIFORNIA RESIDENTS. . TOTAL SAT SCORE OF AT LEAST 1000, AND TOTAL SCORE ON THREE ACH OF AT LEAST 1650 WITH NO SINGLE ACH LESS THAN 500.0. REQUIREMENTS FOR OUT-OF-STATE RESIDENTS. . TOTAL SAT SCORE OF AT LEAST 1100 AND TOTAL SCORE ON THREE ACH OF AT LEAST 1725.0.

What are the costs there.

TUITION AT BERKELEY IS 980 DOLLARS PER YEAR OF THREE QUARTERS FOR OUT-OF-STATE STUDENTS. NO TUITION FOR CALIFORNIA RESIDENTS. ROOM AND BOARD VARIES BETWEEN 600 AND 940 DOLLARS. INCIDENTAL FEE OF 242 DOLLARS. ASSOCIATED STUDENTS MEMBERSHIP FEE 11 DOLLARS. BOOKS AND SUPPLIES ABOUT 80 TO 110 DOLLARS.

How do they choose their students.

BERKELEY SELECTS ITS CANDIDATES ON THE BASIS OF A CANDIDATE'S SECONDARY SCHOOL RECORD AND CEEB SCORES. ALUMNI RELATIONSHIP AND GEOGRAPHICAL DISTRIBUTION NOT RELEVANT.

How about Harvard.

HARVARD CHOOSES ITS CANDIDATES ON THE FOLLOWING CRITERIA. SECONDARY SCHOOL RECORD, SCHOOL'S RECOMMENDATION, AND CEEB SCORES. ALSO, CHARACTER,

PERSONALITY, AND EXTRA-CURRICULAR PARTICIPATION ARE STRONGLY EMPHASIZED. SPECIAL TALENTS AND INTERESTS ALSO CONSIDERED.

How much does it cost to go to Goucher.

THERE IS A COMPREHENSIVE FEE OF 2950 DOLLARS PER YEAR INCLUDING TUITION, ROOM AND BOARD, AND LAB FEES. STUDENT ACTIVITY FEE OF 13 DOLLARS, HEALTH FEE 50 DOLLARS, AND GYMNASIUM OUTFIT 27 DOLLARS. OTHER COSTS INCLUDE BOOKS AND SUPPLIES ABOUT 100 DOLLARS.

What kinds of courses should I take.

16 UNITES REQUIRED, THE FOLLOWING RECOMMENDED. . .ENGLISH (4), MATHEMATICS (3) (2 IN ALGEBRA, 1 IN GEOMETRY), ONE FOREIGN LANGUAGE (3), HISTORY (2), LABORATORY SCIENCE (1). THE COMMITTEE ON ADMISSIONS MAY ALLOW ENTRANCE CREDIT FOR WORK IN ELECTIVE SUBJECTS NOT LISTED.

How do they pick their students.

GOUCHER COLLEGE BASES ITS CANDIDATE SELECTION ON THE SECONDARY SCHOOL RECORD, THE SCHOOL'S RECOMMENDATION, AND TEST SCORES. OTHER IMPORTANT FACTORS ARE PERSONAL CHARACTERISTICS, EXTRA-CURRICULAR PARTICIPATION, AND INDIVIDUAL INTERESTS. ALUMNAE RELATIONSHIPS AND GEOGRAPHICAL DISTRIBUTION CONSIDERED.

I think that I would like to stop now.

WOULD YOU LIKE A SUMMARY OF YOUR EXPLORATION OF THE EDUCATION DATA FILE.

Yes.

FINE.
YOU GOT DATA ON THE FOLLOWING VARIABLES FOR HARVARD COLLEGE. . COSTS, INCLUDING TUITION AND ROOM AND BOARD, HOW THE SCHOOL SELECTS ITS STUDENTS.
FOR BOSTON COLLEGE YOU GOT DATA ON THE FOLLOWING VARIABLES. . COSTS, INCLUDING TUITION AND ROOM AND BOARD, WHAT HIGH SCHOOL COURSES ARE RECOMMENDED OR REQUIRED FOR ENTRANCE, WHAT ADMISSIONS TESTS YOU SHOULD TAKE.
YOU HAVE FOUND OUT ABOUT
WHAT ADMISSIONS TESTS YOU SHOULD TAKE, COSTS, INCLUDING TUITION AND ROOM AND BOARD, HOW THE SCHOOL SELECTS ITS STUDENTS, FOR THE UNIVERSITY OF CALIFORNIA AT BERKELEY.
FOR GOUCHER COLLEGE YOU EXPLORED THE DATA ON THE FOLLOWING VARIABLES. . COSTS, INCLUDING TUITION AND ROOM AND BOARD, WHAT HIGH SCHOOL COURSES ARE RECOMMENDED OR REQUIRED FOR ENTRANCE, HOW THE SCHOOL SELECTS ITS STUDENTS.
YOU DIDN'T EXPLORE THE AVAILABLE DATA ON CARNEGIE INSTITUTE.
NOW THEN. WOULD YOU LIKE TO GO BACK AND FIND OUT ANYTHING MORE ABOUT THESE SCHOOLS.

No

WOULD YOU LIKE TO GO INTO CLARIFICATION NOW.

Yes

OF THE FOLLOWING COLLEGES THAT YOU HAVE EXPLORED, WHICH WOULD YOU CONSIDER APPLYING TO.
HARVARD UNIVERSITY, UNIVERSITY OF CALIFORNIA AT BERKELEY, BOSTON COLLEGE, GOUCHER COLLEGE.

Boston College, maybe Berkeley, and Harvard

ARE THEY LISTED IN ORDER OF PREFERENCE. THAT IS, IS YOUR FIRST CHOICE FIRST, ETC.

No

PLEASE TYPE THEM IN ORDER OF PREFERENCE.

Harvard University, Boston College, Berkeley

YOU HAVE DECIDED TO GO INTO CLARIFICATION CONCERNING YOUR PREFERRED ALTERNATIVE HARVARD UNIVERSITY.
YOU HAVE ACCESSED THE EDUCATION DATA BASE AND GOTTEN SOME OF THE AVAILABLE DATA ON HARVARD UNIVERSITY.
IN EXPLORATION, YOU STATED THAT YOU CONSIDERED THE FOLLOWING TO BE IMPORTANT FACTORS IN CONSIDERING COLLEGE CHOICE . . GRADES, CLASS RANK, TEST SCORES, COURSES, GOAL.
NOW THEN, YOU SHOULD HAVE A FAIRLY GOOD IDEA OF WHERE YOU STAND IN RELATION TO THESE FACTORS AS WELL AS WHERE STUDENTS ADMITTED TO HARVARD UNIVERSITY STAND. RIGHT.

No

WOULD YOU LIKE TO GO BACK TO EXPLORATION TO FIND OUT HOW YOU COMPARE WITH HARVARD STUDENTS.

No

WOULD YOU LIKE TO CHOOSE ANOTHER ACTIVITY.

Sure

WHAT WOULD YOU LIKE TO DO.

Find out about jobs.

HOW WOULD YOU LIKE TO DO THIS.

I would like to access the occupation data base.

O.K.

REFERENCES

REFERENCES

Bohn, M.J., Jr.; and Super, D.E. (1969) "The Computer in Counseling and Guidance Programs." Education Technology. IX, March.

Bruner, Jr. (1962) On Knowing. Cambridge, Massachusetts: Harvard University Press.

Dunn, J.A. (1969) Project PLAN: Guidance Through the Instruction Process. Palo Alto, California: American Institutes for Research.

Ellis, A.B.; and Tiedeman, D.V. "Can a Machine Counsel?" Project Report No. 17. Cambridge, Massachusetts: Information System for Vocational Decisions, Harvard Graduate School of Education.

ERIC CAPS Capsule. (1968) "The Information System for Vocational Decisions." Vol. 1, No. 3, June.

Flanagan, J.C. (1968) Individualizing Education. Palo Alto, California: American Institutes for Research. September.

Gardner, J.W. (1968) No Easy Victories. New York: Harper and Row.

Helm, C. (1967) "Computer Simulation Techniques for Research on Guidance Problems." Personnel and Guidance Journal. September.

Information System for Vocational Decisions. (1967) Annual Report: 1966-1967. Cambridge, Massachusetts: Harvard Graduate School of Education.

Information System for Vocational Decisions. (1968) Annual Report: 1967-1968. Cambridge, Massachusetts: Harvard Graduate School of Education.

Information System for Vocational Decisions. (1969) hird Report: 1968-1969. Cambridge, Massachusetts: Harvard Graduate School of Education. (in press)

Jones, G.B. (1969) Elements in the Prescriptive Phase of a Comprehensive Guidance System. Palo Alto, California: American Institutes for Research. April.

Jones, G.B.; and Nelson, D.E. (1969) Elements of a Comprehensive Guidance System Integrated in the Instructional Process. Palo Alto, California: American Institutes for Research. April.

Minor, F.J.; Myers, R.A.; and Super, D.C. "An Experimental Computer-Based Educational and Career Exploration System." Personnel and Guidance Journal. XLVII.

Oettinger, A. (1969) Run, Computer, Run. Cambridge, Massachusetts: Harvard University Press.

Super, D.E. (1957) The Psychology of Careers. New York: Harper and Row.

Tiedeman, D.V. (1961) "Decisions and Vocational Development: A Paradigm and Its Implications." Personnel and Guidance Journal. 40, 15-21.

Tiedeman, D.V.; and O'Hara, R.P. (1963) Career Development: Choice and Adjustment. New York: College Entrance Examination Board.